Nature Calendar

MAY

The silver buds are on the fir,
The sweet is on the balm,
The orchard blossoms white and slow,
And through the scented calm
The wild thrush-poet lifts to God
His pure and lyric psalm.
—HIGGINSON.

MAY is the month of migrant warblers, for in this month nine-tenths of our stock of these beautiful and delicate birds pass northward through our forests. A few are of limited range in the South, and scarcely leave our borders for the winter. But many summer in our northern states and in Canada, and in winter go far south. Their wanderings are fraught with romance, if we but pause to consider them.

On some bright morning we may awake to find our tree tops musical with bright-coated creatures that have appeared from somewhere in the night. This gaudy one with the yellow black-flecked breast and bars of white across tail and wing, called the Magnolia because the immortal Wilson associated him with that beautiful tree, has come from Yucatan. Straight across the Mexican Gulf he flew, and, working ever northward, last night passed high over one or two broad states. To-day he lingers with us, feeding and resting; to-night, perchance, he will push on. Within a week he will be building his warm nest in the same spruce thicket in Maine or Quebec where last year he and his mate raised their brood.

This flame-breasted Blackburnian, what of him? In the jungles of Peru or Ecuador, amidst the mildness and bounty of the tropics, he spent the winter, and is now hastening to the pine grove where, far out on lofty swaying branch, he first saw the light; and so with this slower-moving Bay-breast, lately from the Colombian wilds, and now on his way to Hudson Bay or Newfoundland, and the tiny Wilson's Black-cap, nervous and restless, on his way to Labrador; they are all far travelers. In the West another band of gaudy wood-elves, those beauties named for Townsend, and Audubon, and Macgillivray, are busy at their May-moving from the Tropics to the Sub-arctics.

In this month, over most of our country, those elves of the air, the swallows, are winging northward. What wonder that birds showing such consummate mastery of the air, whose coming presages warmth, and creatures of such friendly confidence, have always been beloved and revered by country people. In the not-distant past, their sudden disappearance in autumn, and their regular spring-coming, led to the belief that they wintered in the mud of ponds, or even changed to frogs. To those who found it hard to believe such things, legally attested affidavits were presented.

But the real facts attending the migrations of the swallows are now known, and they are scarcely less wonderful than the fables. Our own familiar species, which has so universally taken to nesting in buildings that it is named the barn swallow, goes as far as Argentina for the winter. Originally it nested on cliff-faces, and even now, in remote sections of the West and the far North, it still seeks these ancestral sites. The great barns of our agricultural sections, however, are its delight, and as many as a hundred pairs may sometimes nest under one roof. So those that now sweep the meadows, taking their suppers as they fly, may have for their destination the rocky shores of Winnepesaukee or the Athabaska. And for those latter-bound, who can say whether their broods are to be raised on the face of glacier-scarred cliff, or beneath the roof of the log-cabin of the Indian trapper.

That cousin of our barn-nester, the eaves or cliff swallow, has become equally a companion of man, for when settlement reached its original midwestern range, the bird recognized the value of barn-eaves as nesting sites, and prospered by man's protective friendship. Unhappily there are indications that in some sections this hospitality is not so generous as was formerly the case, and the birds have in consequence diminished.

The tamarack, though not classed as a flowering plant, is more beautiful in its spring opening than many that blossom. Its tiny needles sprout in the daintiest of tufted sprays, giving to its swampy haunts a tinge of delicate green that is unique. Along its rugged twigs are scattered the clusters of young cones, almost ruby-red in their brightness. Together they form one of the most charming sights of our May-time landscape, transforming the swamp-border into a rare beauty spot.

Prepared for Nature Magazine by Edward A. Preble

"FANTASTIC BIRDS SURGING UPWARD THROUGH THE EDDYING AIR"

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NATURE MAGAZINE

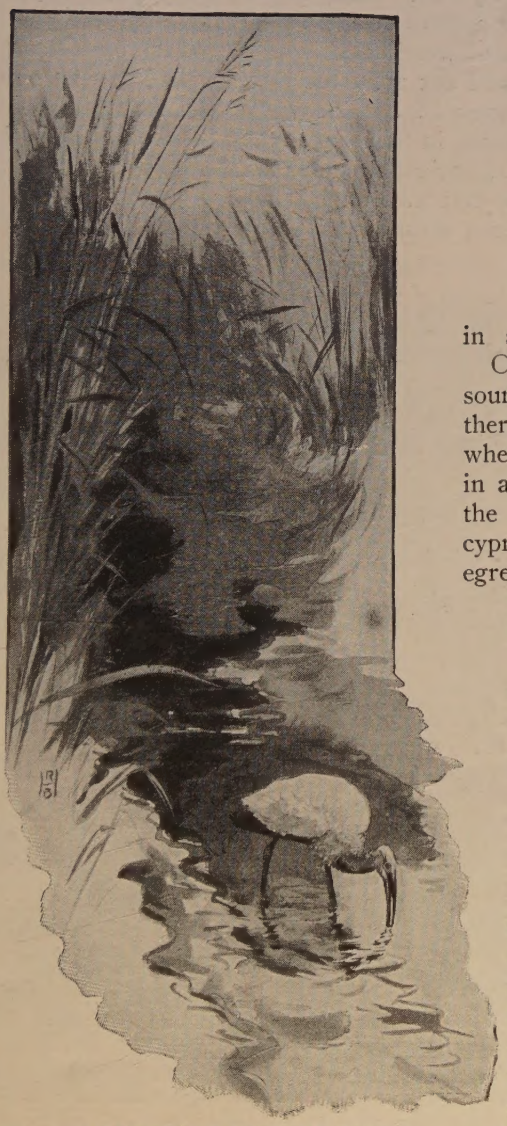
Through a flaming arch we entered
A radiant forest aisle,
Where e'en the lowliest groundling
Seemed now a thing worth while.
EMMA PEIRCE.

Vol. IX Number 5
MAY, 1927

MUSIC of WINGS

By HERBERT RAVENEL SASS

THERE are many sounds in Nature which delight the ear. The songs of birds, without which the green countryside would be almost a dreary place; the shrill, whistling bugle note of the whitetail deer which is uttered only at night and which is one of the rarest and wildest of all woods sounds; the guttural, mysterious voices of migrating herons dropping down through the blackness overhead; the music of the wind in some high, dim, shadowy forest of ancient, straight-trunked pines; the deep-toned thunder roll of the surf beating upon a lonely shore—all these sounds in their several ways bring pleasure to those whose joy lies in natural things and who will not always be pent in cities. Better, perhaps, than any of these, more inspiring, more stimulating to the lover of wild creatures, is another sound, a sound which even the most fortunate of woods-lovers hears but seldom—the sound of wide-wild wings, the wings of a great company of big, beautiful, fantastic birds surging upward through the eddying air in some remote and lovely place.



FEEDING AS THE TIDE EBBS
The ibis finds a rich supply of mullet and shrimp for its meals.

One day last June I heard that sound in a place so lovely that I think there can be no lovelier spot anywhere on earth. We were paddling in a small, flat-bottomed punt along the winding water-lanes of a certain cypress lagoon where many tall white egrets and many herons of various kinds had their nests. We were bound for an egret city situated in the lagoon's upper reaches; and, as always when I visit that lagoon, the magic of the spot had laid its spell upon me so that for the time I was scarcely aware of details but was lost and submerged in the beauty of my surroundings.

I was in another world, a flooded forest of some ancient epoch before man was known, a world of water and of trees. On every side the smooth trunks of cypresses rose from the still surface of the lagoon, their vivid-green feathery foliage forming a lofty roof above our heads, their branches festooned with long,

graceful pendants of Spanish moss. In and out amid the cypress trunks wound the narrow water-lane which we were following in our punt; and in all that watery wilderness of trees, that beautiful hidden lake, which was not so much a lake as it was a forest whose floor was water instead of earth, there was no sound except the sounds of the wild creatures for whom this spot was a sanctuary and a stronghold.

They were, nearly all of them, sounds which were wild rather than musical. Gorgeous orange-gold prothonotary warblers, which had their homes in holes in dead stumps rising from the water, sang to us now and then, their brilliant plumage flashing in the sun. Along the shore of the lagoon orchard orioles sang from time to time, and farther away, in high pine woods beyond, crested flycatchers and red-bellied woodpeckers were calling. But, for the most part, the bird voices which we heard as we paddled along our serpentine watery path were the shrill whistles of ospreys who had built their bulky castles of sticks in cypresses beside our way, and the harsh voices of herons of several kinds—great blue and little blue herons, black-crowned and yellow-crowned night herons.

More than once we heard the raucous cry of a great egret and saw a flash of wide snowy wings ahead of us as the tall bird took flight at our approach; again and again we heard the high, thin note of wood ducks winging like feathered projectiles in and out amid the tall, straight tree-trunks. But these were all familiar sounds which I had heard many times before in that place and in other places, and they were not sufficient to break the spell of the lagoon, or to stir into full wakefulness my senses, drugged with the serene and dream-like beauty of the spot, rich with the untouched beauty of Nature.

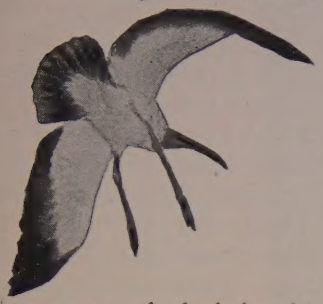
The sound which roused me came later, when we were not far from the egret city which was our goal. It was not made by the egrets, however, and I knew at once that they were not responsible for it. It was that sound which I described a moment ago as so inspiring to the lover of wild creatures—the sound of many wings surging through the air and lifting into flight an army of big birds, wild and fantastically beautiful. All at once, without warning of any kind, that surging sound of mighty pinions filled the air; and in an instant all the other sounds of the lagoon were forgotten, and the mental lethargy which the magic of its loveliness had cast upon me like a spell vanished as suddenly as a dream.

For a moment the sound of wings seemed everywhere —behind us, on both sides, ahead, above. It was as though the forest all around us had sprung suddenly to life—as though in every tree of the flooded woods great pinions were beating mightily. But this illusion lasted only for a moment; almost at once I knew that these wings were just ahead of us and to our right behind a tall screen of cypresses whose trunks stood so close together that there was no passage through them. Past this cypress barricade the water-lane wound in a long loop, and the punt shot forward at full speed so that we might swing round the dense barrier of the trees and see the open space beyond.

In less than a minute we gained the edge of the open. All the while the sound of wings had continued, though in diminishing volume; and before I actually saw them I knew what it was that we were about to see—an army of wood ibises interrupted in their noon nap and reluctantly taking flight as the most watchful ones among

ON EVERY SIDE THE SMOOTH TRUNKS OF CYPRESSES
They rose from the still surface of the lagoon, their lofty, feathery foliage forming a roof above.

them detected the approach of our punt. All at once the whole company of them, a hundred and fifty at least, burst upon our vision as we glided onward through the flooded woods; and when we came into view the noise of their wings was redoubled as those that still lingered in the trees, where they had all been roosting, sprang suddenly into the air.



They were a memorable sight—that army of great birds, almost as big as turkeys, sailing and circling over our heads, their long necks and long legs outstretched, their wide, black-edged pinions gleaming brilliantly white in the bright sun. Round and round they swept, rising higher and higher above the trees, their wings now flapping powerfully, now rigidly extended, sweeping and swerving in and out in a maze so intricate that collision seemed inevitable. For a little while they seemed to fill the air above the cypress tops, and it was then that the spectacle was most splendid and impressive. But memorable as that moment was, it was not so memorable, I think, as that other moment when suddenly the noise of their broad pinions had quelled all the other sounds of the lagoon. That was a moment never to be forgotten—a moment when I listened to the wildest of wild music.

The wood ibis is not uncommon in the region where I live—the Low Country of South Carolina. In fact, in certain parts of the Low Country it may be seen in hundreds from June to October, while a few birds have even been known to winter here. I have traveled for forty miles or more through salt marshes where ibises were so numerous that there was scarcely a moment when none was in sight; and over large areas of marshland this species, which is generally known hereabouts as gannet, is one of the most familiar of all the marshland birds. Yet it is a bird which no bird-lover ever ranks among common things no matter how abundant it may be. Its great size, its striking and impressive form, its odd and interesting feeding habits, most of all its stateliness when seen in the air and a certain fantastic quality in its appearance when in flight, due mainly to its long neck and long legs and its sharply contrasting white and black plumage—all these things combine to render it a bird of perennial interest.

To me there is another important element of fascination in the wood ibis—the element of wildness. More vividly than any other bird of the marshes and the lagoons, the ibis recalls the glamorous early days of America when the white man's civilization had not yet played havoc with all the larger creatures of the wilderness. There is something of the glamor of those days about all the big birds that still survive; and that is one reason why, to many of us, the larger birds are in general more interesting than the smaller ones however rare or beautiful. But, to my mind at any rate, the wood ibis recalls the rich past more strikingly than any other birds which is with us to-day; and doubtless this is due largely to the fact that, although it is less abundant than the herons, the ibis is even more gregarious and is to be seen on the marshes in larger flocks. Hence it makes a more impressive appearance than the herons or any other of the marsh birds and brings back to mind more graphically those vast congregations of wild fowl which were so notable a feature of the early days.

I speak of the wood ibis as a marsh bird, and on this coast it is mainly a bird of the salt marshes. Yet—although it is not really an ibis at all but a member of the stork family—its name is not wholly misleading. During the breeding season it is an inhabitant of the woods, nesting in large colonies in densely-wooded swamps; and at all seasons it resorts to the woods from time to time, especially in order to rest or doze after feeding abundantly on the marshes and tidal flats. Thus in this region it is often to be seen in flocks on the secluded cypress lagoons hidden deep in the woods; and amid those beautiful surroundings it is seen perhaps to best advantage and stirs the imagination even more deeply than on the open marshes, because it contributes to the scene just that wild and fantastic touch which is needed to make the picture perfect.

Abundant as the wood ibis is here in the Carolina Low Country during almost half the year, it is not known to breed regularly in this region. There is only one definite record of its nesting, when, on June 1, 1885, Arthur T. Wayne found a breeding colony in Caw-Caw Swamp; and though I suspect that in the deep swamps near the coast there are breeding colonies as yet undiscovered, it may be that most of the ibises frequenting this district in summer come up from further south after the breeding season is over. Most of them appear to be young birds; but whether young or old, they are nearly always wary and shy, so that, in spite of their abundance, their habits are little known even to woodsmen and boatmen who spend much of their time in the swamps and on the marshes.

This mystery that invests them is another fascinating element in these birds. Often, on the wide green plains of marsh between the barrier islands along the edge of the sea and the wooded mainland behind, I have watched them sailing like airplanes against the bright blue summer sky and have wondered whence they came. Are they all wanderers from those great ibis rookeries in Florida which certainly exist but about which little seems to be known? Or is there, somewhere close by, hidden in one of the great swamps of this Low Country, where there are still many secret places and many secrets, a

IN AND OUT, A NARROW WATER LANE
There was no sound except of the wild creatures for whom the spot was a sanctuary.

great wood ibis city to which the big birds return year after year to breed?

Nearly always you will see the wood ibis—I am taking as a guide my own experience of the bird as I know it here in coastal Carolina—flying high in the air, or resting in compact flocks on the marshes or the tidal flats, or roosting in the woods of the barrier islands, or of the cypress lagoons on the mainland. You will seldom—unless you are very fortunate—see ibises feeding near at hand. In feeding, the flocks often scatter, the birds going singly or in couples to their favorite feeding places. They seek their dinners generally at low tide. Into the deep tidal creeks which wind everywhere through the marshes empty innumerable lesser creeks or gullies, full of water when the tide is at the flood, but dry or almost dry at the ebb. In these small, muddy, winding marsh brooks the wood ibis finds an inexhaustible supply of mullet and shrimp, and it is there that he feeds when the tide is running out and the water is shallow enough for the tall bird to take his stand in the midst of the stream.

Sometimes he will stand motionless, his long, heavy, curved bill partly submerged, the mandibles gaping slightly until suddenly his bill snaps shut and he lifts out a fish. Sometimes he scratches about with his feet apparently to muddy the water and force the fish to the surface to be seized instantly and quickly devoured. But it is only by good luck or very careful stalking that you will get close to him at such a time. He is a wary feeder, constantly on the watch for enemies; and, as a rule, the marsh brooks in which he feeds, hidden from view by the tall marsh grass lining the high banks, are too narrow and shallow for navigation at low tide, while to approach him overland across the boggy surface of the marsh is nearly always impossible.

Only in the deep woods of some fresh-water lagoon, to which the ibises resort when the tides have covered the marshes, may you hope to approach so close to them as to hear the wild music of their pinions as the whole great company of them take flight. Very rarely on the marshes, where cover is lacking, you may enjoy a similar experience; and I remember a summer day a few years ago (Dr. Harry C. Oberholser of the United States Biological Survey will remember it also) when we ran almost into a flock of fifty-two wood ibises resting beside a marsh creek at a point where the marsh grass hid our approaching boat from view. Suddenly and as if by magic, the marsh ahead of us sprang to life as the big birds surged upward, long necks outstretched, long legs dangling, pinions desperately beating the air. We heard the swish and surge of wild wings then; but it was only by luck that we caught those marshland ibises napping, and such fortunate chances are rare.

There is another rare sight which you may sometimes enjoy in wood ibis country—one which I enjoyed that same June morning of last summer when on the loveliest of the swamp lagoons we startled the ibises from their roosting place amid the cypresses and heard the thrilling music of their pinions. For some time after they had taken flight they continued to drift about in the air as though reluctant to leave the place; and for many minutes we sat idly in the punt watching the great birds circle and soar high above us, alternately flapping their wings and sailing, while above them two anhingas circled, and below them blue herons and white egrets passed to and from the egret city up the lagoon.

Suddenly, very high in the air, higher even than the anhingas, a soaring ibis caught my eye. He was sailing on motionless wings, his legs dangling almost straight beneath him; and all at once, as I watched him, he began to rock violently from side to side. First to the right and then to the left the big bird swung his body, slanting so far over that first one wing and then the other pointed almost directly downward. The rocking movement was not only exceedingly violent but also very swift; and it continued until the bird sailing straight onward all the while, passed out of sight behind the tops of some tall trees.

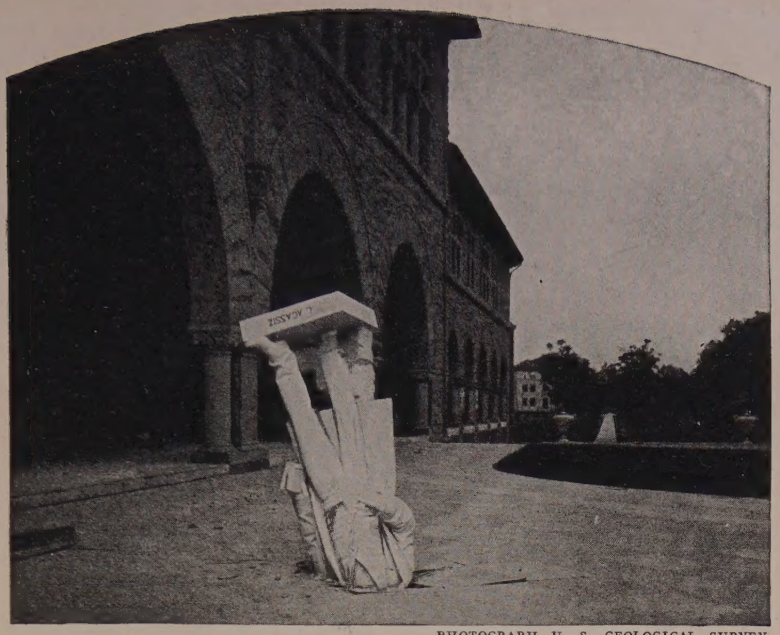
It was a performance grotesque rather than beautiful; for while the wood ibis is a beautiful sight when seen sailing on extended pinions far up against the blue, its beauty lies mainly in its stateliness, and this, of course, vanishes when the big bird seems to go suddenly crazy and begins to cut capers in the high air. Yet that mad aerial dance, a spectacle not often witnessed even in this region where the ibis is a fairly familiar object in the summer sky, was a sight which I would not have missed for the wealth of many worlds.

A beautiful frontispiece in four colors by our artist, R. Bruce Horsfall, will be one of the features of the June issue of NATURE MAGAZINE. *It will serve to illustrate in part a fasticinating story of the Gannet by Donald Culross Peattie.*

There will also be two full pages in color in the center of the June issue.

Charles Fitzhugh Talman contributes another of his interesting and instructive weather articles in June.

Among the other features will be Upstream with the Alewives, by Edith N. Patch; Walking with John Burroughs, by William L. Finley; The Chimney Swifts' Rendezvous, by Joel J. Winkjer; as well as several important regular features.



PHOTOGRAPH U. S. GEOLOGICAL SURVEY.

AGASSIZ SEEKS THE CAUSE OF THE QUAKE
On April 18, 1906, he was tossed from his niche at Leland Stanford University into this pose.

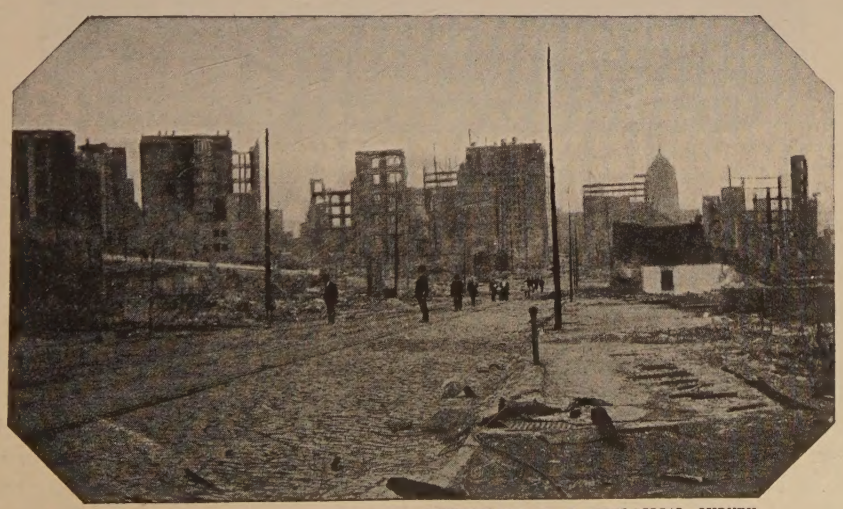
THE WAYS OF AN EARTHQUAKE

By Charles Fitzhugh Talman

In several corners of the world the earth has trembled convulsively a number of times already this year. Scientists expect more quakes before the year is over if the annual average of tremors is to be maintained. In this article Mr. Talman discusses earthquakes in a way which all will wish to read. His account will give color to any newspaper report of a quake in some far corner of the world, or, perhaps, near at hand.

NOT long ago my seismological friend, Dr. T. A. Jaggar, director of the Hawaiian Volcano Observatory, published in a widely circulated magazine a startling account of the destruction of New York City by an earthquake in the year 1932. The death list in this imaginary disaster numbered nine hundred thousand and the property loss was a little matter of fifty billion dollars. Such details as the suffocation of three hundred thousand people in the subways when the ventilating system broke down may have disturbed the slumbers of a good many readers who will never experience an earthquake in their lives; yet the publication of the story was amply justified.

Yes, the world badly needs to be scared out of its present apathy on the subject of earthquakes. New York will probably never undergo a catastrophe like the one described. Nevertheless, such an event is not impossible, and *now,* rather than after it happens, is the time to do something about it. There is no cure for earthquakes, but there are known ways of mitigating, or even nullifying, their disastrous effects. In this respect, earthquakes are much like certain atmospheric visitations, such as storms, floods and cold waves. They cannot be prevented, but mankind can be protected against them.



PHOTOGRAPH U. S. GEOLOGICAL SURVEY.

A SCENE OF RUIN AT SAN FRANCISCO
A view along Ellis Street after the earthquake and fire of April 18, 1906.

Earthquakes are extremely common. In the year 1903 the late F. de Montessus de Ballore published a catalogue of nearly 160,000 quakes known to have occurred since the dawn of history. The number of unrecorded quakes during the same period must have been vastly greater. Recent statistics show that about 4,000 earthquakes perceptible to human senses occur in the world every year. More than ten times as many are registered by delicate instruments. Though the majority of quakes are too feeble to do any harm, there are records of 4,151 destructive earthquakes between the years 7 and 1899 of the Christian era. Of these 423, or more than four a year, occurred during the Nineteenth Century.

The number of

destructive earthquakes is steadily increasing; not because the shocks themselves are more frequent or severe, but because of the increased density of population and especially because of the increase of structures liable to earthquake damage. Our modern cities, with their tall buildings, their fire hazards, and their dependence for fire-protection upon a vulnerable system of water mains, are potential sites of earthquake disasters such as would have been impossible anywhere in the world a century ago.

Certain parts of the world are notoriously afflicted with earthquakes and others are almost entirely free from them. In the eastern hemisphere there is a broad earthquake belt that stretches from the Azores, in an easterly to southeasterly direction, through the Mediterranean region, the Persian Gulf, Northern India, Burma and the East Indies; another which embraces Japan and the other islands east of the Asiatic continent; and a third extending from the Caspian Sea across Turkestan into the heart of Asia. Elsewhere in Europe and Asia earthquakes are of occasional occurrence, but over the greater part of Africa and Australia they are very rare. Italy and Japan are the countries that have suffered the greatest number of destructive shocks. In the western hemisphere the majority of quakes occur along the Pacific coast of North and South America, but there is another quaky belt encircling the Caribbean Sea.

PHOTOGRAPH DR. T. A. JAGGAR.

A FISSUE DUE TO AN EARTHQUAKE

Such cracks are a common effect of the visible waves that traverse soft ground in a severe quake.

Dr. Jaggar has made an interesting analysis of the relative quakiness—or, as it is called in scientific language, the "seismicity"—of different parts of the world, expressed on a scale of ten degrees, this scale being based on the number of earthquakes per year for an average square mile of territory. The quietest lands are rated as No. 1 and the shakiest as No. 10. This analysis leads to the remarkable result that eighty per cent of the inhabited area of the globe is decidedly quaky, belonging to the upper three grades of seismicity. A large part of the United States is comparatively stable, but, says the seismologist, "the district from Washington to Philadelphia (east slope of the Alleghanies) is No. 7, and comfortless emerge the relentless figures that show New York and New England to be in the same category, No. 8, with southern and central California, Cook's Inlet in Alaska and parts of New Zealand and Mexico."

The supposed immunity of certain regions from earthquake visitations often proves illusory. Probably nothing was further from the thoughts of South Carolinians before August 31, 1886, than that the city of Charleston might experience a destructive shaking, and just why the quake in question occurred is still something of a puzzle to seismologists. Another surprising earthquake, which missed by a hair's breadth being a grave disaster, was lately described by the Director of the Coast and Geodetic Survey in an address before the Franklin Institute. He said:

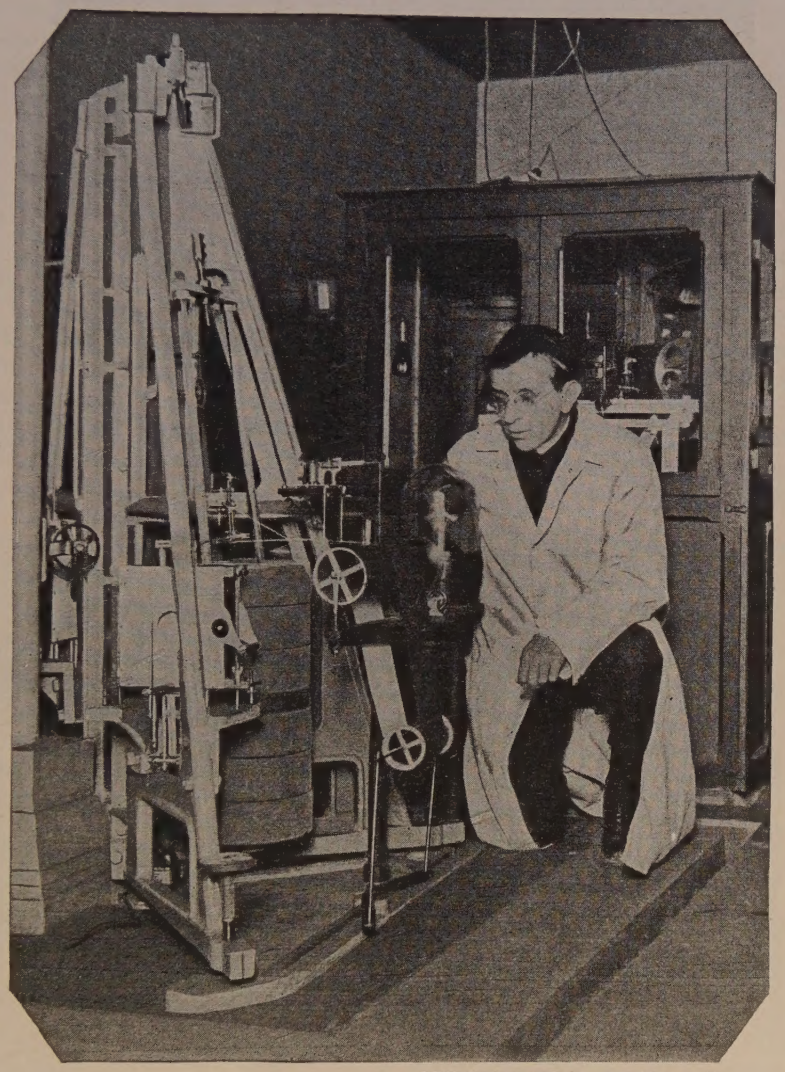
"About 6:00 p. m. on June 28, 1925, the *Olympian,* a fast train of the Chicago, Milwaukee and St. Paul Railroad Company, was proceeding with 350 passengers through Montana. Not a passenger gave thought to any danger and even the most timid had no fear beyond a train wreck. East of Lombard, at a small station called Deer Park, the track followed a narrow canyon. At one place it was so narrow that a short tunnel was found necessary. Adjacent to the tunnel there was a high cliff overhanging the railroad. It was apparently of solid rock and to all indications quite safe. Not even a seismologist anticipated an earthquake in this region. I have been informed that the Dominion Observatory experts at Ottawa could scarcely believe that their instruments were not deceiving them when they located the earthquake in Montana.

"Sixty-eight seconds after the train passed through the tunnel a large part of the cliff came down with a great roar, filling the end of the tunnel, deeply burying the

track, and closing the canyon. Occurring a few seconds earlier, it would have buried the train from sight and no living being would have escaped." This quake was felt over a wide area, and, but for the sparse settlement of the country, would probably have caused great havoc.

Many people think of a severe earthquake as consisting of a violent heaving or lurching of the earth's surface, but such movements, when they occur, are only incidental. The essential feature of an earthquake is a series of rapid *vibrations* in the elastic rocks of the earth's crust, caused by a sudden jar, which occurs, as a rule, some miles underground. The jar is due to the breaking or slipping of the rocks under heavy strains. There are several possible causes for such strains, and there has been much controversy among geologists as to which of them predominate. One quite obvious cause is the transfer of material from place to place on land and from land to sea by the process of erosion and deposition. The point in the depths of the earth where the quake originates is called the "focus," and the spot or area on the surface of the ground directly over the focus is called the "epicenter." The latter is also the place where the strongest shocks are felt.

A typical earthquake begins with a low rumbling sound, which gradually grows louder, and is sometimes mingled with heavy, explosive crashes. The first tremors are felt just after the sounds begin. They are like those experienced during the passage of a heavy train or wagon, and occur at the rate of four or five a second. These preliminary tremors merge into the main shocks of the earthquake, which occur at a rate of only two or three a second; sometimes each lasts more than a second. Then comes another series of less violent and more rapid tremors, fading into a faint quivering motion. The entire duration of these events ranges from a few seconds to three or four minutes. The Charleston earthquake lasted seventy seconds; the California earthquake of 1906, three and a half minutes, which was long enough!



PHOTOGRAPH REV. F. TONDORF, S. J.

GEORGETOWN UNIVERSITY HORIZONTAL SEISMOGRAPH
Note weight, which tends to remain stationary while the earth moves, and strip of black paper for record.

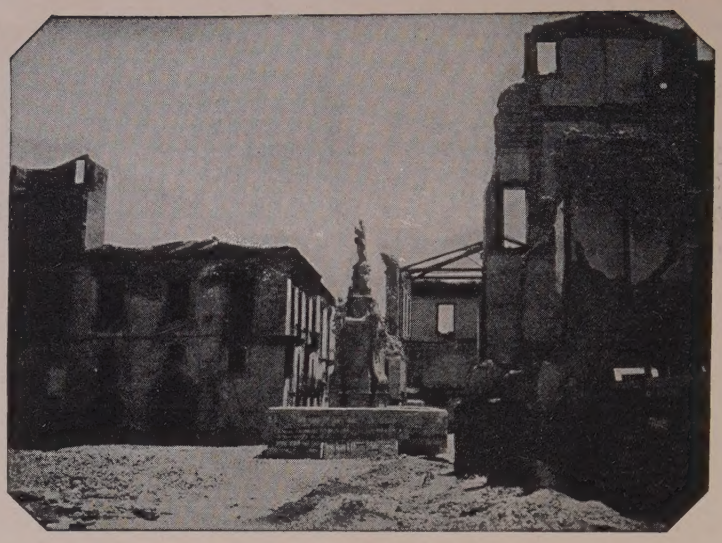
The principal earthquake is often preceded, at intervals of hours or days, by lighter "fore-shocks," and every severe earthquake is followed by a large number of "after-shocks." In the quake that destroyed Tokyo and other Japanese cities on September 1, 1923—the worst disaster of its kind in history—more than a thousand after-shocks were felt during the five days following the main quake. Sometimes the after-shocks continue for years. One of the most interesting cases of this kind is furnished by the seismic history of our own country. During the years 1811 and 1812 a remarkable series of shocks, now usually referred to as the "New Madrid earthquake," occurred in the middle Mississippi Valley. In the course of a few months no less than 1,874 shocks were felt. Eight of these were very severe, and were perceptible over the whole of the then settled portion of the United States. This earthquake produced notable geographic changes; new islands came into existence in the Mississippi, new lakes were formed in neighboring valleys (one of them one hundred miles long), and old lakes disappeared. Light after-shocks have been experienced in this region almost every year since the original disturbance, so that this long-drawn-out earthquake may be said to be still going on!

The ordinary vibratory movements of the ground in an earthquake are very slight, generally amounting to a small fraction of an inch, and never to more than a few inches. In addition to these vibrations, however, there are often seen large waves, which travel over the surface of the ground no faster than a man can run. In the New Madrid earthquake the ground is said to have rolled in waves three feet high, with visible depressions between, the waves finally breaking and leaving a series of parallel fissures.

Besides the earthquakes due to deep-seated movements of the earth's crust under long-continued strain, there are some directly connected with volcanic eruptions and others caused by landslides and other movements at the bottom of the sea. Submarine earthquakes have often

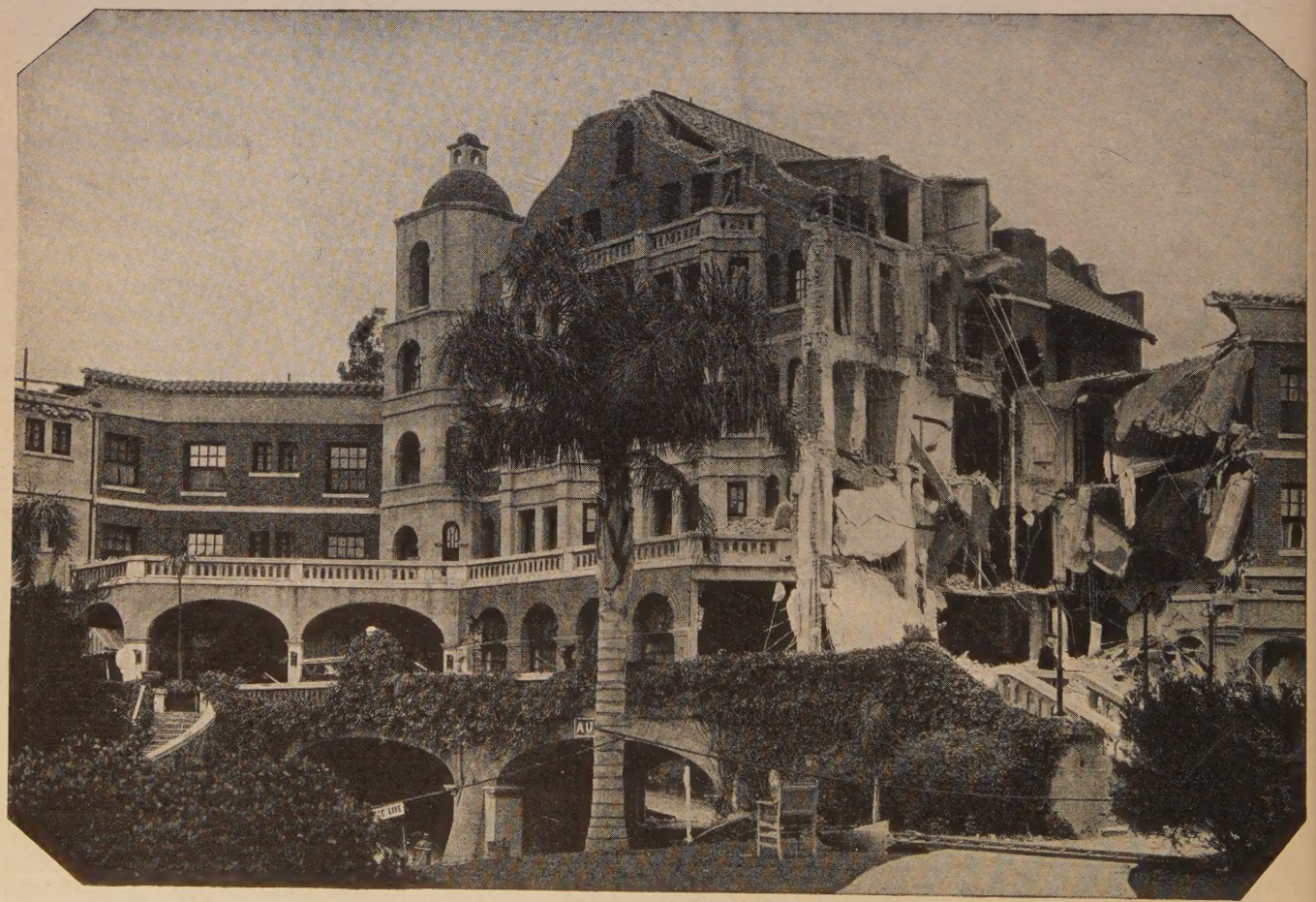
been experienced by ships in midocean. They sometimes give rise to great waves, which may travel for thousands of miles, and which cause a large amount of damage along low-lying coasts near the place of origin.

Nowadays every earthquake of any consequence, whether occurring by land or sea, is registered by instruments known as "seismographs," which may be located hundreds or thousands of miles away from the place of disturbance. The seismograph is essentially a heavy mass of metal, suspended in such a manner that its inertia prevents it from partaking readily of the motion of the earth when the latter is shaken. A pen or sharp point attached to the suspended weight traces a record of the earth's movements on a sheet of paper carried along by clockwork, or, in some instruments, the record is made by a photographic process. Complete apparatus of this kind registers vibrations in three directions — north-south, east-west, and up-down.



UNSCATHED IN THE MIDST OF RUIN
A statue of the Virgin that survived the tremors of the earthquake at Messina.

An earthquake sends out two principal sets of vibrations. One set travels around the earth's surface, while the other takes a "short cut" through the interior of the globe. The latter set is registered first by a distant seismograph, not only because of its shorter path, but also because it travels at a much greater speed. Moreover, the vibrations that pass through the earth are of two kinds, one of which travels faster than the other. Hence the faraway instrument makes three distinct records of each earthquake, and the intervals of time between the successive records show approximately the distance of the quake from the place of observation. Finally, the place where the earthquake occurred can be determined with considerable accuracy by a comparison of the records made by three or more seismographs located in different



PHOTOGRAPH NATIONAL LUMBER MANUFACTURERS' ASSOCIATION.

WHERE A MINOR QUAKE DID MUCH DAMAGE
The Santa Barbara earthquake of 1925 would have been of little importance in a rural area.

parts of the world in the various scientific institutions.

Seismology—the study of earthquakes—is a science of recent origin, dating especially from the investigation by Robert Mallet of the great Neapolitan earthquake of 1857. The first regular system of seismological observations was established in Japan by John Milne. Earthquake observations are now made under official direction in most civilized countries. The work in the United States is conducted by the Coast and Geodetic Survey, with the aid of various official and unofficial agencies, including several colleges and the Carnegie Institution.

The researches of seismologists are of twofold interest to mankind. On the scientific side they have contributed a great deal to our knowledge of the internal structure and composition of the earth. On the practical side they are helping to safeguard humanity against earthquakes. The practical work includes detailed surveys in regions especially subject to quakes, showing the places where the ground is so unstable that special precautions need to be taken in the construction of dams, irrigation channels, aqueducts, bridges and buildings of all kinds. An elaborate investigation of this sort is now under way in California. A careful study of the effects of earthquakes furnishes engineers and architects with valuable information concerning methods of construction and kinds of material best adapted to resist earthquake shocks. There is already a small library of literature on the subject of earthquake-proof construction. The definite prediction of earthquakes has not yet been achieved. It is a goal toward which seismologists are striving.

Just Bugs

THE term bug, as commonly used, is applied to anything that creeps or crawls, but speaking correctly it should only be used to refer to some members of the great order Hemiptera. This name, of Greek derivation, means half-wing and refers to the form of the first pair of wings of true bugs. The upper half of each wing is hard and the other part membranous. Divided into several sub-groups, this order comprises the true bugs, the tree-hoppers, plant-lice, scale-insects, and many others, a number of which are destructive to agriculture. Others, however, attack injurious insects and ought therefore to be carefully spared.

PHOTOGRAPH CORNELIA CLARKE

TWO YOUNG NYMPHS AND EGGS OF THE TRUE BUG FAMILY

The eggs are like little cups of blue satin and usually found on leaves. Most eggs of true bugs are highly ornamented.

In this order of "bugs" belongs the family Pentatomidae, and the accompanying illustration shows two young bugs or nymphs of this family and some unhatched eggs, similar to the ones from which the nymphs have hatched. Most bug eggs are highly ornamented with prettily contrasted color patterns, ribbed or beaded, and shaped like little tubs or barrels with a sort of cover lid.

In common with the greater number of true bugs, the ones illustrated have the characteristic habit of emitting a substance of disagreeable odor. The source of this fluid is a pear-shaped gland which occupies the center of the thorax and which terminates between the hind legs. If you touch or frighten these insects they will discharge this substance and you will recognize at once, by smell, that they belong to the bug families.

Bugs are chiefly sucking insects owing to the form of the mouth. The beak which consists of a sharp-pointed piercing organ and the sucking tube is made up of the various mouth-parts. They chiefly nourish themselves with the juice of vegetables and the blood of other insects.

Undergoing an incomplete metamorphosis the young at birth resemble the parent in most essential characteristics, and therefore do not suffer any very great external changes during development. The young or nymphs are, generally speaking, distinguished from the parents only by the absence of wings. After changing their skin several times, or moulting, they gradually develop wing pads. After a last change of the skin the wings appear in their perfect state and the insect is considered to be an adult, ready to fare forth boldly.

The Seventeen Year Locust

By
A. B. Champlain
and
H. B. Kirk

FATHER SEVENTEEN-YEAR LOCUST
Male periodical cicada seen from below and showing plates covering the sound-producing organs.

ACCORDING to predictions, the periodical cicadas or "seventeen-year locusts," those Methusalehs of the insect world, are again scheduled to make their appearance in various parts of the country. No less than thirty broods of this spectacular species have been tabulated by Government and state entomologists who have located them, studied their activities and checked up on their time of appearance over periods of many years. Looking forward through their eyes we are now prepared to foretell that Brood Number I will be with us in 1927 and Brood Number II in 1928, and about what territory these appearances will cover. Persons living in the areas indicated on the map on the third page of this article should be on the watch for them in suitable situations.

Celebrated on account of the regularity of their appearance in certain localities every seventeen years in the middle and northern States, and every thirteen years in the southern States, they excite wonder and speculation. They do not appear simultaneously over the whole country, but a brood that has colonized a certain district or area will appear periodically every seventeen or thirteen years. Countless thousands will swarm over this territory for a short time and then vanish. The mystery of all this can easily be explained if we watch the actions of these remarkable creatures for a while, prying into their personal affairs and getting a line on their habits and life history.

For those who have never met the periodical cicada we will sketch a hasty portrait. It measures about one and one-half inches long, has a dark-colored body and an abdomen banded with orange. Like all insects it has six legs with which to walk about and is among the number that possess four wings, two on each side. The wings are shiny and transparent, with orange colored veins at the base and front margins that blend into brown as they grow smaller. Brown markings that resemble the letter "W," if your imagination is good, may be seen on each front wing. This is interpreted by the superstitious as a forecast of war. Meeting our cicada face to face we note the wide forehead with prominent bright red eyes that stand out on each side of the head, a character that gives it the additional name of "red-eyed cicada." Our cicada has no jaws but takes its food with a slender reddish colored beak used for piercing the plant tissue and sucking out the juices. If their visits were annual this sap-sucking habit would no doubt cause noticeable damage to trees and plants; fortunately they

PERIODICAL CICADAS ON FOLIAGE
Both the cicadas and the pupal shells they have cast off can be seen here.

are not, and no visible injury is apparent.

A further point of interest is the sound-producing organ, an elaborate drum-like apparatus on the under side of the thorax and abdomen of the males, who alone are capable of producing the loud noise or song. This accomplishment has furnished an opportunity or excuse for every author on insect lore from Xenarchos, the Rhodian of early times, to our present day writers, to ply their witticisms on the advantage of a voiceless wife. But suffice us to say that, odd as it may seem, no real reason can be assigned for this phenomenon. The males may "shrill" their chorus, sing their "Pharaoh" song or squawk their alarms, but according to all investigators the females, lacking ears, do not hear and apparently pay no attention to the noisy chatter of their mates.

WHICH IS THE HERO OF THIS TALE?
Three common cicadas and the seventeen-year locust, the one at the right (all somewhat reduced).

Females of the species, however, do play a part in the economy of our civilization as destructive agents. After mating they are most naturally interested in egg-laying, which in this instance is the cause of all the trouble. First they cut a series of slits or punctures with their powerful egg-laying apparatus or ovipositor in the twigs of various trees or plants. It is in these slits which have been formed into smooth chambers that the eggs are arranged in neat longitudinal rows. It is easy to be seen that a number of such punctures or slits in twigs will greatly weaken them. This is exactly what happens, the wind and weather will break them at this point and then they hang, brown and dry, to disfigure the landscape as well as to cause injury to the plant.

When orchards and nurseries are in the path of these invaders the damage is greater and more noticeable. Growing fruits break the twigs at the weak points and foliage and fruit wither and spoil. Again the injury may affect the growth of fruit for the next year. On the whole, however, there is but slight permanent injury to trees, the scars soon heal, and, as soon as the insects die off, their presence and the injury they did will soon have been forgotten.

Returning to the egg question we learn that it requires six weeks or more for them to develop to the hatching point which takes place during the middle or latter part of July. The young cicadas or nymphs, upon emerging from the eggs, drop from the trees and hide themselves in cracks in the soil. At this time they look very much like fleas, but they are furnished with spiny legs and large strong thighs which are capital instruments for digging. Working their way into the earth they often attain a depth of a foot or eighteen inches below the surface and here they live their long underground life. No wonder the periodical cicada stands out as unique among the insect tribes, sixteen years from egg to adult, toiling away in its subterranean burrows below the surface of the earth and sucking the sap from the small roots that grow in their neighborhood for subsistence.

Changing their clothes every two or three years, which in this instance means shedding their old skin, the young cicadas grow slowly but surely as the years roll by. Finally, when the spring of the seventeenth year is at hand, our cicadas, now in the last pupal stage, are ready for their next adventure.

When Maytime gives her magic signal up they come, hiding for a while beneath the surface of the soil under

STAGES OF THE PERIODICAL CICADAS
Left to right: Two pupae as they emerge from the ground; an empty pupae shell; two adults, wings at rest, one with wings spread.

stones and sticks. Another springtime call and out they come in countless swarms, crawling up the trunks, fence posts or any object that happens to be in their path while the ground is covered with the round holes from which they have emerged.

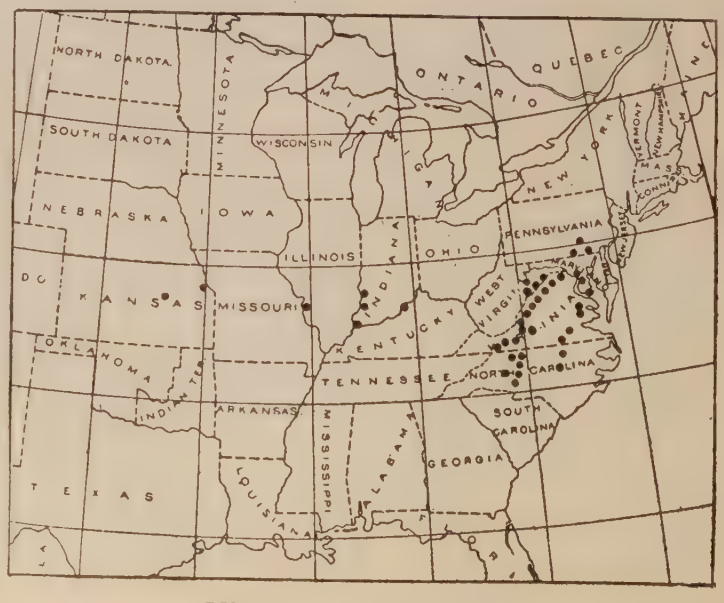
We will examine a specimen just out of the ground. What a queer khaki or tan-colored creature it is at this time. About an inch in length, it has well-developed legs that were at first used for digging but are now used for the more necessary purpose of attaching itself firmly to the object upon which it comes to rest. Soon the skin splits down the back and out of this shell comes the winged adult cicada, at first somewhat pale and limp but quickly drying in the air and sunlight; it hardens up, then flies away into the tree tops.

IN THE WAKE OF THE LOCUSTS
Browning and withered foliage is caused by breakage of the trees at the point of egg punctures.

Brood X of the seventeen year or periodical cicada made its appearance in 1919. In the mountain regions around Harrisburg, Pennsylvania, they swarmed at their best and we made a number of trips into the valleys and interviewed them. They began to appear during the latter part of May and were at their height during early June. At that time almost every tree and plant that covered the landscape held hundreds of them, they were perched there in rows or massed like a mob, some crawling, some resting, everywhere "locusts." The noise—call it a song if you wish—of the males could be heard continuously from daylight till dark, louder and more intense during the hottest parts of the days. We collected numbers of the insects for study, took notes and records on the "brood" and made the photographs that illustrate this article. A farmer stopped his work and eyed us curiously, he advised us that it was a dangerous matter to handle "locusts" as their sting was poisonous and deadly. We soon demonstrated the fallacy of this supposition, which is general in many places, by handling them without harmful results. All they could do was to flutter their wings in protest, or if the specimen happened to be a male, let out a squawk of indignation or fear that would be somewhat disconcerting to the uninitiated.

We found that in certain damp areas the emerging pupae built chimneys up around their burrows to a height of several inches while in the hard ground the holes, about three-eighths of an inch in diameter, were level with the surface of the surroundings.

Shortly after the time of egg-laying had passed we found the ground strewn with dead "locusts" or fragments of their bodies. What a harvest for the little creatures that lurk in the brush, mice and chipmunks, the ants and other scavengers that clean up Nature's floor after the birds had taken their toll from the tree tops. For a locust year is a time of feasting for a surprising array of creatures. Besides the various small insectivorous birds that may now forego their normal constant quest for tiny game in the face of this unwonted abundance, a host of others now prey on the restless hosts. Crows gorge themselves and their nestlings with the cicadas, and even the hawks deign to glean them from the branches. In some localities domestic fowls scarcely need other food while this supply holds out, and even dogs and cats relish the tasty morsels. But even such vast hordes must come to an end, and the chirring gradually subsides. Soon will all have disappeared, but leaving to the future a vast progeny that will go through a similar process with the climax that comes in their lives seventeen years later.



DISTRIBUTION OF 1927 BROOD
Map adapted from Bulletin 71, U. S. Bureau of Entomology publication, written by C. L. Marlatt.

Camera Hunting In The Northland

By William L. Finley

CHAPTER VII—AFOGNAK AND KODIAK

RETURNING from the Pribilofs and cruising along the south shore of the Alaska Peninsula, we met a patrol boat and one of the Federal fish and game wardens.

"Why don't you go to the head of Seal Bay on the north side of Afognak if you want bears?" said he. "Last August we had a job there of blowing out some rocks at the falls so the salmon could get above to the spawning beds. We hired a man that reckoned he was an expert with blasting powder, put him ashore with provisions and helped him make camp by the falls a mile up the stream. We were to return in a week, but had a break-down that kept us tied up at Kodiak, and it was nearly three weeks before we returned. The fellow was camped on the beach and walking the shore line when we came in sight, and he certainly was all 'het up.'

" 'How can you expect a man to work at them falls!' he shouted as we approached the shore. 'This place is alive with bears, the kind that weigh a ton and eat men. They don't want any rocks blown out. They ganged up on me. I'm through.'

"And that's why the job ain't done yet," said the warden. "If you want bears, that's the place to go."

That night I sat in the pilot house listening to our captain, the skipper of the patrol boat, and the warden trying to agree as to the location of Seal Bay. Each put it in a different place. The two latter insisted that the maps were all wrong.

THE PORCUPINES WERE FRIENDLY FELLOWS
They ambled about the camp and they were always handy for a stray shot with the camera.

"That may well be," returned our captain, "for the dotted outline on the coast chart indicates that this part of the island is unsurveyed."

That day the whole coast line looked as if it were indented with bays. We saw many rocks that lifted their heads above tide line. Others were just on the surface, where the water whitened, and some must have been just below. But the *Westward* nosed her way around islands from bay to bay and safely dropped anchor toward evening in a place that answered the warden's description.

While some of the members of our party reconnoitered the river in a canoe, I wandered along the bank hatless and hunting wild flowers. Striking a trail, I pushed on through the grass and alder clumps to a place where the grass had been flattened down. Just beyond this the grass and sand had been scooped out, making a big, round bed, a comfortable place for a *bear*. Suddenly, a movement beyond attracted my attention and a big, shaggy, brown-face appeared through the leaves. I was face to face with the fellow I had been hunting for days and weeks. My camera was safe on board the yacht. I stood hatless and gunless with a little bouquet of flowers in my hand. In a flash it occurred to me that perhaps the little bouquet of flowers was singularly appropriate for my prompt demise, for an Alaska brown bear has a reputation for aggressiveness. For a moment we stood facing each other. Then perhaps the comedy of the situation appealed to the big fellow. He dropped down out of sight in the bushes, and I quickly dropped out of sight in the other direction. The question as to whether the Alaska brown bear is dangerous has been settled in my own mind. It depends upon the individual bear.

We camped at the still undynamited falls a mile up stream, but no bears came to fish. Cam and I packed on up, taking in addition to provisions a light rubber boat or air-raft which weighed eleven pounds and could be carried in a pack sack. This was one of the handiest pieces of equipment we had, for with this we explored five different lakes higher in the mountains. We saw where bears had been catching and eating salmon, but they had gone farther back in the mountains for salmon berries, luscious fruit that was now ripe and abundant.

Returning to the mouth of the river, we found fresh tracks of an old mother bear and her cubs, and were in high hopes of getting some photographs, when suddenly four natives or Aleuts appeared on the beach, walking up the opposite side near the river's mouth. They had come into Seal Bay to seine for salmon, and now toward evening were intent on bagging a bear. Each carried

a rifle. They advanced slowly with guns ready for action.

"Our chance for pictures has gone glimmering," I whispered to Cam in disgust. "Let's show them we were on the ground first."

Suiting the action to the word, I boldly arose, followed by Cam, and walked toward two of the natives who were coming up the river bank. The other two had gone to the top of a little rise and were looking away from us, watching intently a trail that came out of the woods. One of the Aleuts along the river spied us walking in the tall grass, threw up his gun and took aim. I expected to hear the bang of the gun and the whiz of the bullet, but we didn't look exactly bear-like so he lowered his gun. Saying nothing, we walked down toward the river and sat in the grass about a hundred yards away. The Aleuts got together for a powwow, all standing on a little knoll watching the edge of the woods some little distance up the slope.

THE RUBBER BOAT WAS VERY HANDY
Deflated it took up little space and inflated it was a safe and sturdy craft.

We had all been waiting quietly for about fifteen minutes when off at the edge of the woods above the Aleuts came the unmistakable bawl of a bear cub. Each of the natives faced that direction with guns ready for action. Cam and I tried to wade the stream, but it was too deep. Then another wail from the cub, that seemed to come from some bushes across the river. One of the Aleuts ran down to the river bank where he could see if the bear came on down out of the bushes. Just then a cub weighing about thirty pounds appeared, and, not seeing the Aleut, started on up the beach. The hunter jumped to get a better view and was aiming to shoot when I leaped to my feet with a loud yell.

"Don't kill him! He's a pet!," and the force and volume of my voice were as of one speaking with authority, for the native lowered his gun and the others looked surprised. The cub sat down in the grass and looked around to see where the noise came from. He really acted like a tame cub, for then he ambled along through the grass as if hunting for amusement. Soon he disappeared into the bushes again. The Aleut joined his three companions for another powwow as to the plans of action.

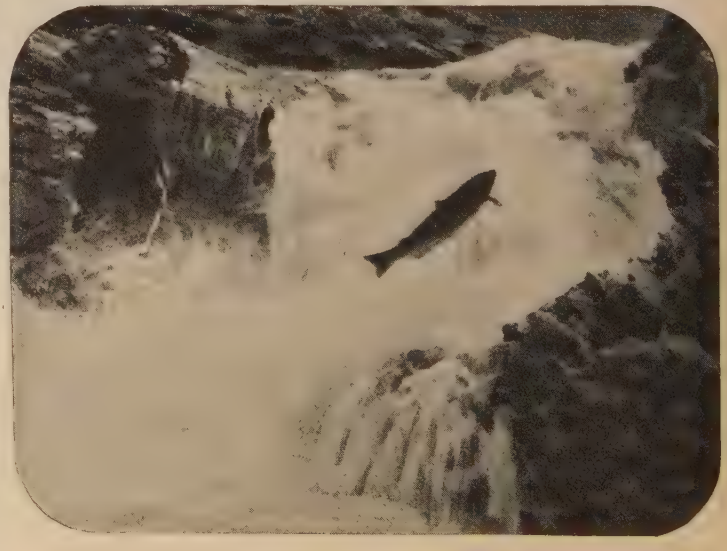
A few minutes later the oldest native in the bunch stood up and shouted across to us. "What you say? Yours?," pointing in the direction where the cub had been.

"Yes, my pet cub," I replied.

"The mother may be there in the bushes or in the woods above," whispered Cam, "and there may be some action yet," and he unlimbered his camera, although it was a little dark for pictures. The Aleuts, however, were suspicious, holding their guns ready for action but they were afraid to approach the place where the cub had disappeared. Darkness was creeping over the meadow. A flock of mallards whirled up the river and dropped into a marshy place. Schools of salmon flapped on the shallows above, as the tide retreated; and the four Aleut hunters filed off around the point toward the bay.

The old mother bear and cub had been on their way down to the river when she scented the hunters. A cub is obstreperous at times, and his bawling may have been the result of a spanking the mother gave for not keeping close in a time of danger. He would have lost his life if I had not come to his rescue. He must have joined his mother a little later, for we heard no more of him that night, nor did we see the bears the next morning, although we were on watch at daylight.

Both Afognak and Kodiak Islands are indented with numerous bays, at the head of which are many fine rivers yet unnamed. One morning Cam and I were up at two-thirty and set out in one of the motor canoes, towing the Old Town Canoe. We took sleepingbags and cameras, hard-tack, canned goods and other provisions to last several days.



THE LIFE STORY OF THE SALMON IS EPIC
It fights a mighty struggle, buffeted by rocks and churning currents, to win through to spawn and to die.

We motored up stream, past picturesque cliffs and through a series of rapids, until we reached the shallows and had to leave the heavy canoe. Packing our provisions in the light canoe, we towed and paddled on up to a big eddy, above which the water ripped between rock walls. The eddy was filled with salmon, sockeyes or reds and humpbacks known as pink salmon. The canoe frightened the fish until the water boiled and we were spattered from stem to stern. The sockeye or red is the main commercial fish of Alaska. When it comes in from the ocean it has a bluish tint. As it works on up to fresh water, the color of the body gradually changes as it nears spawning time. The body is a bright red, plainly visible in the water below. As male and female struggle on up the stream, the reds are easy to follow because of their color. The name "humpback" comes from a peculiar hump that develops on the back of the male. It would look very much like the centerboard of a boat, if it were on the under side. In shallower waters one may see the humps projecting above the surface, as the fish struggle on over the riffles.

We waded on up shallow places where salmon bumped against our boots, struggled betwen our legs and had to be kicked out of the way. The whole bottom of the river was ploughed and furrowed by spawning fish, wallowing out their beds or nests in the sand and gravel. It was uneven wading, and one had to watch when he stepped lest he drop unexpectedly over his boot tops. Crevices in the rocks were filled with salmon eggs. These fish die after spawning, and salmon lay on the banks and hung from the bushes and trees. The river smelled of salmon. The water tasted of salmon. Yet, for lunch we ate canned salmon. One interested in natural history can not tire of a fish that so stirs the imagination with its romantic life and remains a teaser to the palate after hours of bodily exertion. Mystery hides the travels of the salmon in its four years of life in the sea. How instinct guides the race! From the unknown depths of the ocean the fish return to the parent stream. Under the spell of the spawning instinct the salmon buffets rocks, leaps rapids on to the cool gravel bars of birth. Why such a mighty struggle when death is the only result?

ANEMONES BLOSSOMED HERE AND THERE
The beauty of the northern flowers in summer was a source of constant delight.

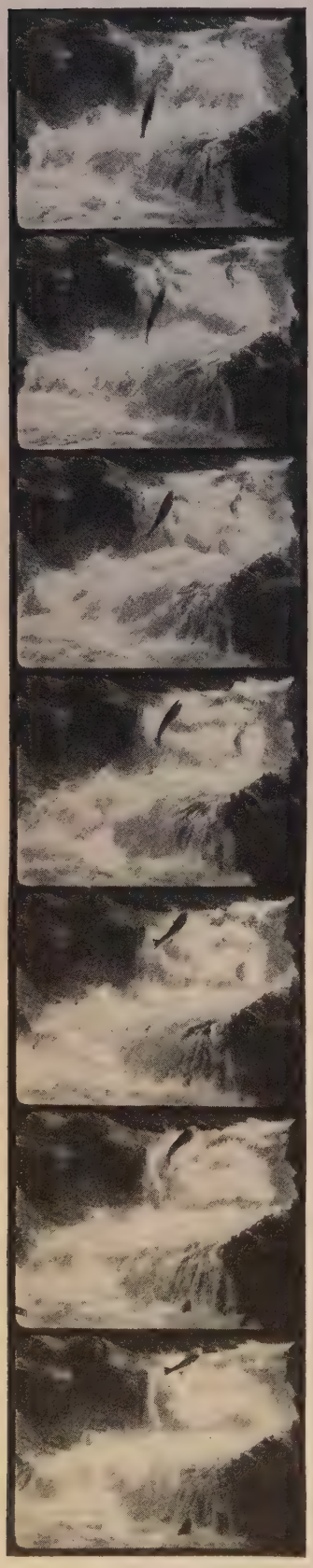
From beginning to end, the salmon is always on the firing line. In the open ocean he is pursued by seals and by other animals of the sea. Gulls and crows gather at the feast on the tide-flats. Bald eagles perch above the gravel bars, and magpies flock in the bushes along the banks. Brown bears watch the shallows. Cormorants or shags live along the coast line at points strategic to the salmon streams. Unending is the pursuit of mergansers or shelldrakes that hunt the clear water where the salmon fry live. Terns and kingfishers glide along the shores to spear fingerlings that play too near the surface. Last, but not least, are men with inventive genius, who snare and catch the salmon by many methods. One might wonder how the numbers hold up when a wise Nature has furnished a fish so palatable for many species. Out of a thousand or more pink eggs that the mother salmon has packed closely in her sac, if more than four or five came through from egghood to maturity, the streams would be so overcrowded that the end and aim of Nature would be thwarted.

SOME ELUSIVE MOUNTAIN SHEEP
They proved to be difficult fellows to shoot with a camera although a man with a gun could have gotten them easily.

Chapter VIII—Moose of Kenai

Nearly a century and a half ago Captain Cook sailed the coast of Alaska around Kenai Peninsula, in his search for a northeast passage to Hudson Bay. From Alaska Peninsula extending for almost twelve hundred miles along the Aleutian chain, is one of the longest

and straightest lines of volcanic action on the globe. In 1912 Katmai erupted with such terrific force that it is recorded as one of the greatest volcanic upheavals in history. If Katmai had been located where New York now stands, the column of steam that burst from the volcano could have been seen as far north as Albany. The rumble and roar of the eruption could have been heard as far west as Chicago. Sulphuric acid fumes would have swept across the states as far as the Rocky Mountain region. Philadelphia would have been deluged in ashes a foot deep, and her people would have groped in total darkness for sixty hours.



THE SALMON LEAPS

It fights its way to the spawning ground in answer to the insistent demand of instinct.

One day when we were making camp on Kodiak Island, I reached up to pull some bunches of moss from the limbs for a bed. I was showered with white volcanic ash. Years ago that moss had been matted over by the ash from Katmai and this layer still remained under the new growth. The tops of the mountains were still white with drifts that had swept across from Katmai.

After picking up two guides by the names of Tony Martin and Al Peel, we set off for the head of Kachemak Bay at the west end of Kenai Peninsula. In a light cruising canoe we worked up Sheep River and packed up above timber line to the high divide between Sheep and Fox Rivers.

After a long hard climb, we made camp that evening at the side of a little lake high in the mountains, where we found a few straggling willows for fire wood. The next morning we were up at four o'clock to hunt mountain sheep. Cam, Al Peel, and I swung off to the right to get above where the sheep were. Campbell and Tony started below. The game was to keep the sheep from sighting or scenting us. We were given time to get lo-

MEET THE ALASKAN BROWN BEAR

He is a big fellow but his dangerous habits vary with the disposition of each individual bear.

cated above where the band was. Then coming up from below and keeping behind boulders, Campbell had a chance to see two lambs at play. Each rose up on his hind legs and then ran at the other, butting and pushing. The ewe was lying down watching them with interest. A little later, when she arose and started feeding, the lambs followed. One swung off to the left and at an unexpected moment caught his mother amidships. She meted out no punishment, because it was her fault for being off guard.

We tried hunting mountain sheep several times after this. We could have brought them down easily with a rifle, but it was most difficult to bag them with a camera.

AN UNUSUALLY CURIOUS MOUNTAINEER

Most of them were of no disposition to linger around and investigate these beings with cameras.

I had no way of telling these sheep how harmless I was. Perhaps it is just as well, for the next man may carry a gun instead of a camera. When we couldn't shoot sheep we could always picture porcupines. They ambled about our camp in a friendly manner. There is some-

thing very deceptive in estimating size and distance in these mountains of Alaska. Several times we saw porcupines off on the slopes and mistook them for black bears. Below where we were camped was a little mountain valley where the grass grew tall. In places where the water seeped out, hellebore with its tall stalk and wide-ribbed leaves reminded one of giant patches of skunk cabbages. Wild parsnip flourished nearly as high as a man's head, and along the slope were patches of alder scrub ten or twelve feet high, a fine place for moose, but a difficult country to hunt in the raining spells that are born among the mountains. We had played hide-and-seek with moose for several days, and we were "it" all the time. The Kenai moose is the largest of its kind in the world, a grotesque creature with great antlers, huge body and long legs. It looks like a strange survival of some remote, geological period.

One day, watching through our field glasses, we saw a big bull moose lying on a little knoll a long way down the mountain. Cam and I set out down the canyon to get around to the windward. The others were to watch from above and perhaps head the animal off if he came their way. Crawling on our hands and knees, we finally approached the spot and heard him eating just beyond in a patch of alders. Once or twice he gave a snort or cough that struck us tense with expectation. Half an hour passed before the moose moved out of the alders. The instant our cameras clicked he stopped, turned to look, and was away into another alder thicket. Down the mountain we ran at top speed, circling around to get ahead of him. We tried the same trick again of creeping up close and catching him in the open. At times we could see his antlers through the alders. He had not been scared very badly, for he kept feeding on down the slope.

The men up the mountain had been watching our movements. The old bull was somewhere in a patch between us. We didn't know which way he would come out, so Cam and I maneuvered for positions to get a shot. Cam followed up a well travelled moose trail through a patch of alders into an open space, and there stood the moose fifty feet away facing him. He stepped over beside a half dead tree and began taking pictures. At that moment the ungainly animal lowered his antlers and shook himself from head to tail, the long hair of his neck bristling straight up as the fur of a cat does when she sees a dog.

"Stay behind the tree!" yelled Tony Martin, who sensed this challenge of the moose. But Cam was busy taking pictures.

The only chance a man has with a charging moose is to get behind a good tree, but there were no trees of any

PHOTOGRAPH BY SCHALLERER

A SUNSET ON THE KENAI PENINSULA

With such glorious sights as these it was hard always to keep the camera on the alert for wild life alone.

size in this part of the country; and a moose can go five yards to a man's one. The moose stepped slowly forward with his right foot, then took a slow step with his left. Away went Cam down the trail, disappearing in the alders, the big animal gaining rapidly, with lowered antlers, a few feet behind.

"He's a dead boy!" yelled Tony, jerking his gun from its holster, as he jumped over a rim of rocks to the alders twenty feet below and hurried to the scene. The rest of us rushed in. Both the moose and Cam were gone. Cam had plunged down the steep trail through the alders, dodged sharply to the left as the moose tore by, hitting him a glancing blow on the arm. Fearing a return charge, Cam, the instant he was struck, whirled back up the trail, then into the alders, and there he was a hundred yards up the mountain side. He is perhaps the only boy who has foot-raced with a mad moose. I had not expected the moose to charge, as his antlers were still in the velvet. Tony, however, had noticed that the tips were bare and worn off. Some people are lucky. Cam was. I was unlucky. The moose didn't come my way and so I had missed the picture of a life time.

Squirrel Aviators

By Ernst Keil

OF all the squirrels inhabiting the United States, the flying squirrels are least known. They are nocturnal in their habits, venturing out of their hiding places in hollow trees and old logs only at dusk to frolic and play when most of the other wild creatures are asleep. Their name, flying squirrels, is somewhat misleading because they do not fly in the sense that birds do, but parachute-like folds of skin connect their fore and hind legs, enabling them to glide gracefully over considerable distances. The body and tail are shaped quite flat; the latter, being nearly as long as the whole body of the animal, serves as a sort of rudder when executing aerial gymnastics. Big, dark-colored eyes guide them in their nightly excursions. Our southern ones are much smaller than their red or gray cousins, measuring only from eight to nine inches from tip to tip. Clad in rich soft fur, brownish above and pure white below, they are indeed beautiful creatures as they play about woodland homes.

PHOTOGRAPH BY THE AUTHOR

FEASTING ON SOME PEANUT BUTTER
Some such bait was necessary to keep the squirrel in one place long enough for a time exposure at night.

The chief diet of flying squirrels consists of small nuts and seeds, many night-flying insects, and they are particularly fond of the larger moths.

Like most wild creatures flying squirrels are susceptible to kindness and respond readily to good treatment, and make exquisite pets. A friend of mine had six. At night they would take to the trees to romp and forage. At daybreak they would return to their cage, curl up among the dry leaves and take a well deserved nap. When sleeping they assume a most remarkable pose with their body bent in a circle, the head resting at the base of the tail, which, in turn, covers face, neck and back so that they resemble tiny puff-balls of fur. They seem to like company and are usually found in small bands.

My own observations indicate that flying squirrels hibernate, at least in southern Ohio. For several years I have had a band under observation. There were about twelve in the troop and they had a den in the hollow trunk of a large oak tree. Every night from early spring until late in autumn they would come to our food-board for birds to enjoy the peanuts and other titbits they knew were waiting there for them. As soon as the first cold weather ushered in the winter they would den up in their quarters in the old oak tree, interrupting hibernation only when the weather was mild to take a swing through the bare woods. I have seen and heard them as late as December but never from then on until early next spring were they in evidence.

Among their enemies the owls are, perhaps, the most formidable, with their skill in hunting when night covers the earth. However, the uncanny swiftness of the flying squirrels gives them an even chance, and although I have never witnessed the capture of a flying squirrel by an owl, I have found a lone tail of one as silent evidence.

Dinah and the Dinosaur

A Nature Story with a Smile

by
LOUISE REDFIELD PEATTIE

"IN THE days of the Dinosaurs, some ten million years ago—"

Ten million years ago! Dinah put down her book to think how long was ten million years. Just trying made her sleepy. So did the warm sun in the garden, and the letters on the page danced. She closed her eyes to shut them out.

"Goodness gracious me!" said a curious high, thin voice. "What an extraordinary creature!"

Dinah opened her eyes to see who had spoken, and then she rubbed them and stared again. Before her loomed a Something quite as tall as the village church, but very evidently an animal, because it was standing on its stumpy hind-legs in the manner of a huge kangaroo, and even as she stared it dropped down on all fours and shook its absurdly small head.

"I can't imagine what it is," said the animal, staring back, "but I don't believe it bites," it added doubtfully.

"Why!" said Dinah with a gasp, "you're a Dinosaur!"

"Of course I am," said the Dinosaur in the high, thin voice that matched its silly expression rather than its size. "You sound as though that were something surprising. It's really you, you know, who's queer. I never saw anything in the least like you. Come here, specimen, and be examined."

Dinah held tight to the garden seat. "I suppose *you* don't bite, either?" she asked doubtfully.

"Mercy, no!" said the Dinosaur with scorn. "Horrid stuff, meat. I belong to the herbivorous branch of the family."

Dinah slid down and advanced with some hesitation, as the Dinosaur lowered his long neck. His head came very close indeed, which made her heart thump, but his expression was bland and foolish, and she ventured to give him a timid little pat on the nose.

"That's it," said the Dinosaur with a pleased and silly smile, "don't be afraid. Old Brontosaurus wouldn't hurt a pterodactyl."

"Are you really Brontosaurus?" cried Dinah, delighted. "Why, he was one of the biggest!"

The Dinosaur's smile grew so wide it vanished beyond each eye, and he wagged his tail with such satisfaction that it smashed down one of Dinah's mother's mulberry bushes. He curled his neck around to look at his distant other end, and said vainly, "Look at it—thirty feet long, that tail."

"I didn't think a tail could grow that long," sighed Dinah, marvelling.

"Oh, as to that," said Brontsaurus—and his face fell—"Zeuglodon, the sea-serpent, has forty feet of tail to only ten of body and four of head."

PHOTOGRAPHS BY BERTHA D. REDFIELD

"DON'T BE AFRAID, STRANGE CREATURE, "Old Brontosaurus wouldn't even hurt a pterodactyl. What are you anyway?"

"Yay!" screamed a voice from the trees above them. "Plenty of tail, but what about b r a i n s? Everybody knows you haven't got two pounds of brains in that pin-head of yours."

The Dinosaur wilted as much as his size permitted.

"That's Archaeopteryx," he told her, nodding to the branches. "I know I'm not clever, but that fellow is so beastly conceited. All because he's the first bird. Humph! He's not so much better than the rest of us. He's linked to us reptiles, too, for all he's ashamed of it."

A serpent-like hiss came out of the trees, and Archaeopteryx fluttered down upon a nearby bough. He was somewhat smaller than a crow, and trailed a tail longer than his body, with feathers set down each side.

"What's this object, Bronty?" he asked

rudely, staring at Dinah. But before she could make an angry retort, she caught a glimpse of the bird's open bill.

"Why, you've got teeth!" she cried in amazement.

"Naturally," said Archaeopteryx. "Why people talk about things being 'as scarce as hen's teeth' I'm sure I don't know."

THE TRICERATOPS FAMILY OUT FOR A STROLL
The old chap is a bit of a fighter if you cross him, Bronty told Dinah, adding, "Don't get on the wrong side of him."

Here the Dinosaur put in a word, as was, apparently, the frequent wont of his kind.

"Teeth!" he said scornfully. "Look at Thespesius. There's teeth for you. He's a cousin of mine," he explained to Dinah. "Stands twelve feet in his stocking feet. Of course we reptiles renew our teeth as fast as they're worn out, but Thespesius, he's got a reserve supply of four hundred or so tucked down in his lower jaw alone."

"Yah!" said Arhcaeopteryx impudently. "He hasn't got feathers, though. Nobody has but me!" And he flapped off.

The Dinosaur snorted. "He thinks he's so 'scloosively modern.' We're all of us up-to-date Jurassic around here."

"Jurassic?" repeated Dinah uncertainly.

Brontosaurus stared. "You can say the periods, I hope?" he questioned accusingly.

"I'm afraid not," she admitted. "Though at school we have to say the Presidents and the Kings of England."

"Cambrian, Ordovician, Silurian, Devonian, Carboniferous—Lower—and Upper—Permian, Triassic, and Jurassic," he rattled off. "That's all since the beginning of the earth."

"Then come the Lower—and Upper Cretaceous and the Tertiary," said Dinah suddenly. "That's in the book, I remember."

"*We* leave off with the Jurassic," said the Dinosaur coldly. "What are you, thing?"

"The book says I'm a mammal," said Dinah doubtfully.

"Never heard of such a thing," Brontosaurus shook his head scornfully. "There's never been anything, in *my* day, but us reptiles, and the fish and amphibians, and

ONLY A DINOSAUR OUT BROWSING AROUND
The beast looked as amiable as a cud-chewing cow but its very size made Dinah shiver.

Archaeopteryx. And the invertebrates, of course, but they're hardly in our class socially!"

"I should like to meet some of the others in your family," said Dinah hastily, hoping to put him in a better humor. "I'm sure they're very interesting."

The Dinosaur grew quite pink with pleasure as far down his length as Dinah could see. "Come along, Mammal," he said, and put down his head for her climb up on.

A QUEER CREATURE GAZED FROM THE REEDS
Archaeopteryx was sunning himself there and another dinosaur hallooed greeting.

With the little girl seated upon his neck Brontosaurus lumberingly set off into the woods beyond the garden. Dinah had never seen anything there bigger than a rabbit, but when they came out of the trees to the edge of the lily swamp she gave a gasp of amazement. Wallowing in the water were two huge creatures and another smaller one of the same extraordinary shape.

"The Triceratops family out for a stroll," said the Dinosaur with a genial wave of his tail by way of introduction. "Nice people, though old Triceratops is a bit of a fighter if you get on the wrong side of him."

"Look, he's got three horns on his nose," squealed Dinah excitedly.

"The usual number," remarked Brontsaurus calmly. "How de do, folks," he added cheerily as they passed the browsing monsters.

"Humph," was all the Triceratops said, and winked their piggy little eyes.

With slow footsteps that shook the soggy earth, the Dinosaur crossed the marsh, Dinah holding tight to his neck. Once a queer creature raised a flat head on a long neck from the reeds, with a toothy grin. Once they came upon a bat-like Pterodactyl clambering over the rocks. They passed Archaeopteryx, sunning himself there, too, but he haughtily turned his back. Another huge Dinosaur raised himself on his hind legs and hallooed greeting from beyond some tree tops. "One of the Iguanadons," said Dinah's guide, and when they passed a browsing Dinosaur so much larger than Brontosaurus that the little girl shivered, though the beast looked as amiable as a cud-chewing cow, her new friend pointed him out with pride as Brachiosaurus. "The biggest of our family, a hundred feet if he's an inch," said her new friend.

THE CARNIVORE LEAPED AT CLUMSY STEGOSAURUS
Dinah screamed and hid her eyes as the great animal bellowed in pain at the attack.

The monsters all seemed amazingly peaceful and orderly, and Dinah began to lose her fears, when a terrible snorting and roaring broke out in the woods. She could feel Brontosaurus shuddering all down his sixty feet.

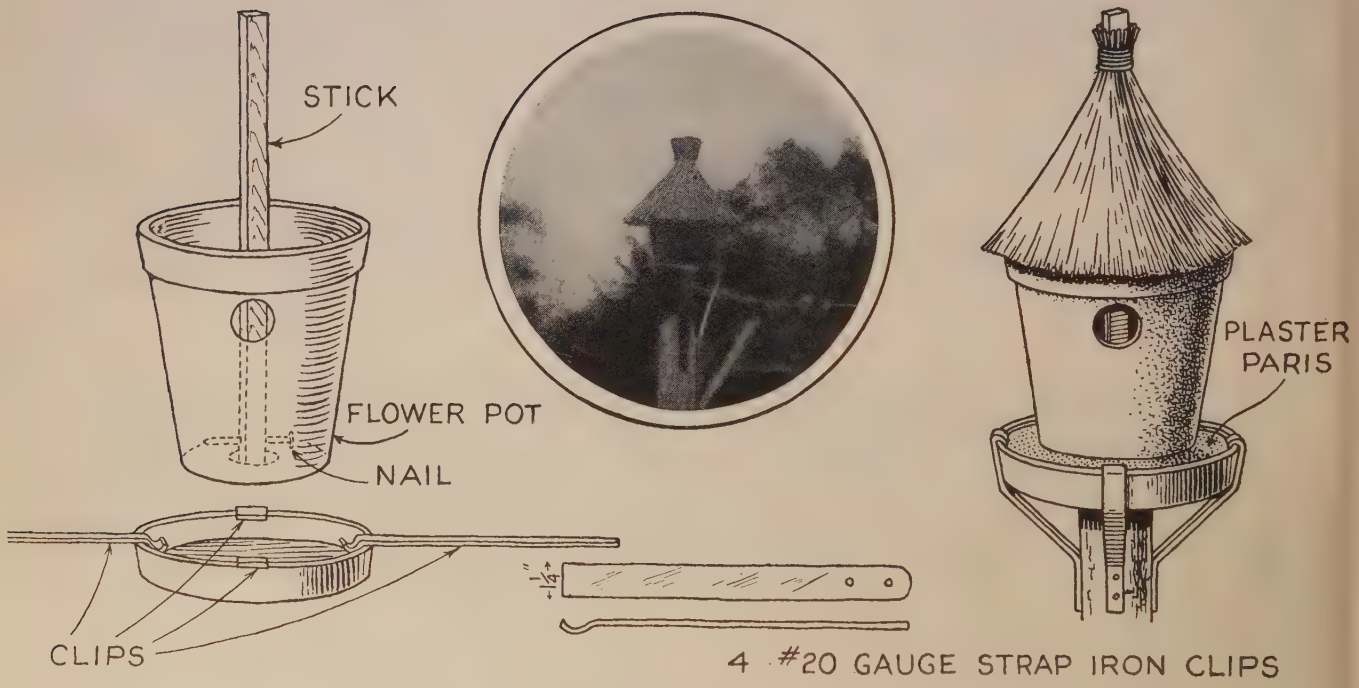
"It's one of my carnivorous cousins, I expect. Lordy, let's get out of here!"

But just then came plunging through the woods the most amazing animal that had yet appeared. He had a double row of great horny plates all down his back, and he roared and growled with terror, for after him came a smaller Dinosaur with a blood-thirsty expression.

"That awful little ruffian Cerotosaurus!" gasped her friend, backing away in alarm. "The fellow with the pie-plate trimming is Stegosaurus. Suffering Sauropods, look at that!"

The carnivore leaped fiercely upon the clumsy Stegosaurus, burying his teeth in his horny hide. The monster bellowed with pain, and Dinah screamed,hiding her eyes.

When she opened them again she gasped, for gone were the ancient monsters all, and she was back on the garden seat, with a little brown squirrel regarding her from the branch of a big old oak where he munched.



A UNIQUE BIRD HOUSE

MANY are the interesting styles of bird-house architecture, but here is a new one, artistic in appearance and depending upon nothing more unusual than a common flower pot of terra cotta, with its companion saucer. Into this pot and two inches down from the top a hole one and one-half inches in diameter is cut by chipping with a sharp-pointed tool and smoothing out with the large blade of a jack-knife, and finishing off with a coarse file. Then plaster of paris is poured into the saucer to a depth of a half-inch and, while the cement is still fluid, the pot is set in.

To hold the thatched roof there must be a stick about ten inches long with a wire nail crossways of it about an inch from one end. The plaster is poured around the base of this, covering the nail and thus holding the upright securely. From some heavy galvanized iron available at any hardware shop, four iron straps an inch and one-quarter wide are made and secured in the saucer with plaster cement. The last step is the roof, made by first binding the straw to the central stick with wire or stout twine and then spreading over the top of the edge of the pot with enough to spare to allow for eaves all around. The house, of course, may be painted, green or brown being preferable, and while the paint is still wet, sand may be sprinkled on and allowed to dry. The house would seem to be especially suitable for wrens.

Nature Explorers

A Program for the Camp

by Dorothea Clark

SUMMER camps present a splendid opportunity to acquaint campers with the wonderful out-of-doors and to open their eyes that they may discover for themselves the interesting things in the world about them. Often, however, it is difficult to get the proper attitude on the part of a large number of individuals who are thus living together. In some, the natural interest in woodlore is still unawakened while others have an unnatural or forced interest which borders on sentimentality. The summer camp should try to foster a normal growth of interest in Nature which will become a part of the camper's life wherever she may be.

Camp directors in general and Nature councillors in particular, will find much that is helpful and suggestive in the story of the successful experiment at Camp Bonnie Brae, Girl Scout camp in the Berkshires of Massachusetts.

The Girl Scouts at Camp Bonnie Brae feel that they have discovered a game which helps to solve the problem of stimulating the proper attitude and promoting a natural growth of interest in this important subject. Everyone in camp from the youngest to the oldest, including councillors, was eligible to play the game, but of course no one was required to participate in it. The game consisted in accomplishing a certain number of quests and thereby advancing from one rank to a higher one. All who started to play the game were required to pledge [illegible] to give or receive help in attaining the quests. Then each person was given an orange disk to wear on the left sleeve which signified that she was a Seeker, the first rank in the game. Each morning, at breakfast, a quest was announced such as: "Catch a mosquito and count his legs and wings," or "Measure the shadow cast by some object at two different times in the day. Tell the differences in direction and length."

The answer to the quest was written out briefly by each Seeker and dropped into a box reserved for that purpose. The correct answer was announced at breakfast the following morning and a few interesting remarks made about the quest. Sometimes different individuals reported their varying experiences.

When a person had completed six quests she was required to establish a claim. This meant discovering some plant, insect, mammal's home, bird's nest or some

A POW WOW OF THE NATURE EXPLORERS
The younger adventurers in the fascinating land of Nature report on their discoveries of the day on the trail.

other object about which she had known nothing, and finding all she could about it, first through observation and then by consulting a reference book or some person who could give her the necessary information. With this done, the girl was elevated to the rank of Finder and her new badge showed the head and antennae of a fire fly.

For the next rank, seven additional quests had to be attained and then the candidate received sealed orders. This consisted in getting written directions of something to be done. Going over the Treasure Trail which lead to various interesting natural objects about camp was one instruction. An Insect Trail which lead to the abodes of plant lice, two kinds of wasps, galls, and spiders, the insect's cousin, proved a popular order. At each place a question, the answer to which depended upon observation, was asked. Some of the orders required girls to use ears and noses as well as eyes. The mystery of not knowing just what to expect appealed to the girls. On fulfilling these requirements the player of the game was made a Beholder and wore a disk showing the completed body of the firefly to designate her accomplishment.

A REAL FIND!
The Nature exploration yields something of high value for study by the explorers.

The highest rank of the Explorer's Game was completed by getting eight additional quests and going on a great adventure. When several people were ready for an adventure, they were summoned to report at a certain time and place. Sometimes it was early in the morning and a trip by boat up the creek was made where birds, flowers, trees and all sorts of wild life were abundant. This helped to round out the experiences which had gone before and provided the "thrill" which a real adventure should give. The players were now called Revealers and wore a disk showing the whole firefly with abdomen brightly colored with orange to signify light. But the game was not over for these people, for, as Revealers, they had to give light to others. They now made the quests, the sealed orders and planned the adventures for the rest: they were the makers of the game. It was with great spontaneity and enthusiasm that the Revealers responded to the requests for suggestions for quests.

The possibilities of the game are great, for included with the quests about birds and flowers have been some pertaining to health habits and health observations. Many of the phases of camp craft having to do, for example, with selection of firewood, and building of fires might be included. Effort was made to have a variety of subjects covered with an occasional easy question. It was also necessary for the proper functioning of the game to have the completion of the quest depend upon actual observation.

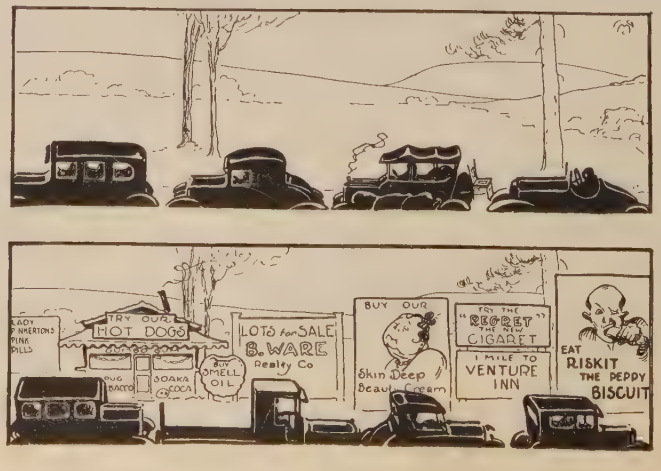
As a result of the game, there was a marked change in the attitude of the girls and councillors as a whole toward the birds, trees, flowers and other wild life. About five hundred girls and thirty adults became keener observers, and also acquired a certain amount of knowledge. But most important was the apparent desire to know more about the things they saw and the ability to grasp the significance of their observations. That this new interest was not temporary was indicated by the desire of many campers to have the quests sent home to them that they might continue the game. Others have discussed the possibility of using the game during the winter in their Girl Scout troops.

So the Bonnie Brae Explorers have developed a seeing eye and an inquiring mind. Playing the game has enriched their lives because of the awakened and sincere interest in the world about them. They hope that others will try a similar game.

Highways

or

Buy-ways?



A CARTOON BY FLORENCE G. McCABE SUBMITTED IN THE AMERICAN NATURE ASSOCIATION'S CONTEST.

PHOTOGRAPH BY GUY C. CALDWELL

A WHITE MARSH MARIGOLD
Some of the western species of this flower change the golden-yellow dress for white.

Give the Wild Flowers a Chance

By P. L. RICKER

President, National Wild Flower Preservation Society

WITH the first warm days of spring, Nature lovers are taking to the woods and fields and few return without having picked at least a few of the first attractive flowers to be discovered. Unfortunately most flowers do not take kindly to being carried for any length of time in the hand, or worn in the buttonhole, without soon presenting a sadly wilted appearance. Many will not revive if placed in water and the paths and roadsides adjoining the cities are often strewn with large bouquets that have given little or no satisfaction to the well-meaning gatherer.

Those who have room for a garden will get more enjoyment from the flowers by carefully taking up a few roots of some of the less rare kinds with a fair-sized ball of earth and transplanting for a wild flower garden. The roots must, however, be planted in as nearly the same conditions, as to soil, shade or moisture, as that from which they were taken. If the normal soil was quite moist, an extra amount of moisture must be supplied by artificial means, or the roots replanted in a naturally wet place. Many people are setting aside from small to quite large areas for wild plant cultivation. This is the only way that any wild flowers will remain near densely populated sections, for in reality the problem of wild flower preservation has been caused largely by real estate, agricultural and manufacturing development and field and forest fires. Fires often destroy millions of seeds and roots and until new plantings are made by the wind and by birds the ground will often present a bare appearance for quite a while. The lighter wind-borne seed which is usually the first to come up after a fire is mostly of a very weedy character, so Nature lovers should be particularly careful that any discarded matches, cigars or cigarettes are not responsible for the further destruction of our native landscape. The extensive distribution of small slips and posters on paper or cardboard bearing "The Outdoor Code" will do much towards obtaining the public cooperation and they may be obtained from the Wild Flower Preservation Society in quantity at small cost.

Small lots of native eastern wild flower seed, referred to in the Society's announcement in the advertising pages of this issue, are also now available for the first time, and readers who wish to cooperate in the movement are urged to collect additional well-matured seed of the native attractive flowered herbs, shrubs, and trees, during the season and send them to the Wild Flower Preservation Society for distribution and exchange purposes. Care should, however, be taken that enough seed is left or scattered where the collecting is done, to insure an ample supply of both flowers and seed another year. All seed must also be carefully named

THE OUTDOOR CODE

HELP save the trees and wild flowers,
Protect the birds and game,
Keep the highways beautiful,
Pick up the picnic rubbish,
Put out your fire; then bury it.

JACK-IN-THE-PULPIT—*Arisaema triphyllum*

BIRDSFOOT VIOLET—*Viola pedata*

MARSH MARIGOLD—*Caltha palustris*

HEPATICA—*Hepatica americana*

VIRGINIA BLUEBELL—*Mertensia virginica*

BIRD-ON-THE-WING—*Polygala pauciflora*

and should in all cases be accompanied by a small pressed specimen of the flower with leaves in order that the name of the seed may be critically determined.

Among the most satisfactory flowers for the beginner starting a wild flower garden, are the common blue, white and yellow violets. They prefer a partially-shaded situation, spread rapidly and will in a few years furnish an abundant supply of flowers for the garden and home decoration. Among other flowers that may with care be obtained for the home garden are the following:

The Jack-in-the-pulpit, *Arisaema triphyllum,* also called Indian Turnip, is found in moist woods and thickets from Nova Scotia to Florida, west to Louisiana, Kansas and Ontario. In North Carolina it reaches an altitude of five thousand feet. This odd plant has a hooded funnel-like body, which is not the flower, and a conspicuous, dark, fleshy, club-like body, giving a fancied resemblance to a pulpit orator. The upper part of the club-like body is sterile and the numerous small flowers are at the base. The staminate (male) and pistillate (female) flowers are usually borne on different plants. The plant has a bulbous base and if the leaves are pulled up with the flower the plant will not grow again, as the leaves are necessary to aid in storing up a new supply of starchy food material in the bulb. Like most of the other members of the Arum family the root is very acrid, due to innumerable microscopic needle-like crystals of oxalate of lime, called raphides. Three or four other closely related species are found mostly in the southern states. To children this is always one of the most attractive flowers, and to all Jack has a message, "Enjoy us, do not destroy us."

PHOTOGRAPH BY E. L. CRANDALL

OUR FRIEND, THE COMMON BLUE VIOLET
This attractive wild flower is one of the most satisfying as a beginning of a wild-flower garden.

The Bird's-foot Violet, *Viola pedata,* is found in dry fields and open woods from Massachusetts to Minnesota, south to Florida and Louisiana. The upper petals are dark violet and the lower lilac-purple, while a variety has the flowers entirely lilac-purple. It prefers acid soil and does not take kindly to cultivation unless this condition is successfully maintained. Its deeply cut bird-foot-like leaf character is quite different from most of the other violets and it does not have the small, hidden flowers at the base of the plant. On this account it is rather rare and much in need of protection.

The Marsh Marigold, *Caltha palustris,* also called Cowslip, is found in swamps and wet meadows from Newfoundland to South Carolina, west to Saskatchewan and Nebraska. The flowers are one to one and one-half inches in diameter and most attractive for water gardens, but are rare in most localities and should be protected. One other similar species with smaller flowers is found in Eastern United States, and about six other species are found mostly in the Western states. In some of these species the flowers are white and in one with much smaller flowers and floating leaves the flowers are often pink. They belong to the Crowfoot family.

The Bird-on-the-wing, *Polygala paucifolia,* also called Fringed Milkwort, Flowering Wintergreen and Gaywings, is found in moist rich woods from New Brunswick and Saskatchewan south to Minnesota, Illinois and Georgia, being confined largely to the mountainous sections of its more southerly range, and ascending to an altitude of two thousand five hundred feet in Virginia and it belongs to the Milkwort family. In some the central part of the corolla is white or rarely the entire flower white. Occasionally a few small, hidden, underground flowers are also found. The root has a decided wintergreen flavor. The flowers are rare and much in need of protection.

The Hepatica or Liver-leaf, *Hepatica americana; H. triloba,* belongs to the Crowfoot family and is found in woods from Nova Scotia to northern Florida and west to Manitoba and Missouri and in Alaska. It is one of the earliest spring flowers and as the young leaves and flower buds unfold they are covered with long silky white hairs. The flowers at first are usually deep blue and, often vary to pinkish or nearly white in color. The leaves on the under side are of a dark purplish-red color, like the liver, from which the plant gets its name. While the flowers are common in many places they should not be picked for large bouquets unless very abundant. Only one other species, with more sharply lobed leaves is known from North America. Its range is similar to the above but it is rarely found near the Atlantic coast.

The Virginia Bluebell, *Mertensia virginica,* belongs to the Borage family and is found in low meadows and along streams from southern Ontario to New Jersey, and South Carolina, west to Minnesota, Nebraska, and Kansas. One similar species is found in the eastern states and about thirty other species mostly in the western half of the United States. The flowers wilt quickly and should be picked sparingly unless abundant.

PRESERVE WILD FLOWERS
May-baskets should not be filled with flowers growing rare.

SOME INTERESTING NATURE ACTIVITIES FOR MAY

By E. Laurence Palmer

WHITE-THROATED SPARROW
With him about, your May day will start with a smile.

A MONTH that begins with the joyous abandon of a May Day and ends with the reverent reserve of a Memorial Day ought justly to be expected to yield a wide range of other types of activities, and so it is with Nature activities in May. We might glance over the list of men whom the month has given to us, but after we have run upon the names of Emerson, Horace Mann and Louis Agassiz we are satisfied that it is unnecessary to go further.

May Day is frequently an occasion for the selection of a May queen. A glance at the pictures of some of these "queens" cannot fail to impress one with the fact that there is a wide range of beauty represented among the selected parties. And so it is with the things in Nature which make the greatest appeal to us. For many perfectly obvious reasons, I have never asked my mother to call me early because I was to be queen of the May, but I have repeatedly asked her to call me before daylight on May mornings so that I could hike the mile to my favorite trout brook and get there before the first robin announced the new day. I would cast my vote for queen-of-May experiences to the sensation one gets with the first lusty strike of a big trout some misty May morning. If a white-throated sparrow were sitting on a branch and singing in the rain, I might be inclined to cast my vote for that experience. Ordinary May-queens may grow old, gray and even develop nagging dispositions, but white-throated sparrows will, I hope, always be with us to help start the day with a smile even if we are too lazy to get up and go trout fishing.

Speaking of the call of the white-throat, though, I might ask you to determine whether any of the tones are within the range of the scale as represented on a piano. Is this true for the love song of the chickadee? Where is the call of the mourning dove pitched? While you are at this sort of thing you might like to join one of my students, Mr. Harwell, who sees a symphony orchestra in the bird chorus. He gives the goldfinches and white-crowned sparrows places as first violins, the purple finches and vireos, second violins. Meadow larks supply the cello music and the thrushes and bluebirds the flutes. Chickadees and kinglets come forward with their piccolos, and quail, the trombones. To these are added the bass viol of the mourning dove, the oboe of the screech owl, the brass horn of the great horned owl and the bass drum of the ruffed grouse. Snare drums are supplied by woodpeckers, traps by the kingfishers and cymbals by the bluejays. I haven't begun to give you the entire orchestra which he has worked up for his symphony but I am sure that with this start you can work up a local orchestra which will make any May Day ramble more worth while to you.

May Day may end with the hanging of May baskets, and if it does it will be interesting to check up on the contents and find which have been filled with

SHEPHERD'S PURSE
The study of weeds is one of many surprises.

flowers which should have been left to flourish in their natural setting. Nature Magazine in the past has mentioned frequently those flowers which should be preserved and left untouched if they are not to become exterminated. The present precarious status of many of our most attractive wild flowers has come about through thoughtlessness and the very spirit back of the hanging of May baskets is thoughtfulness.

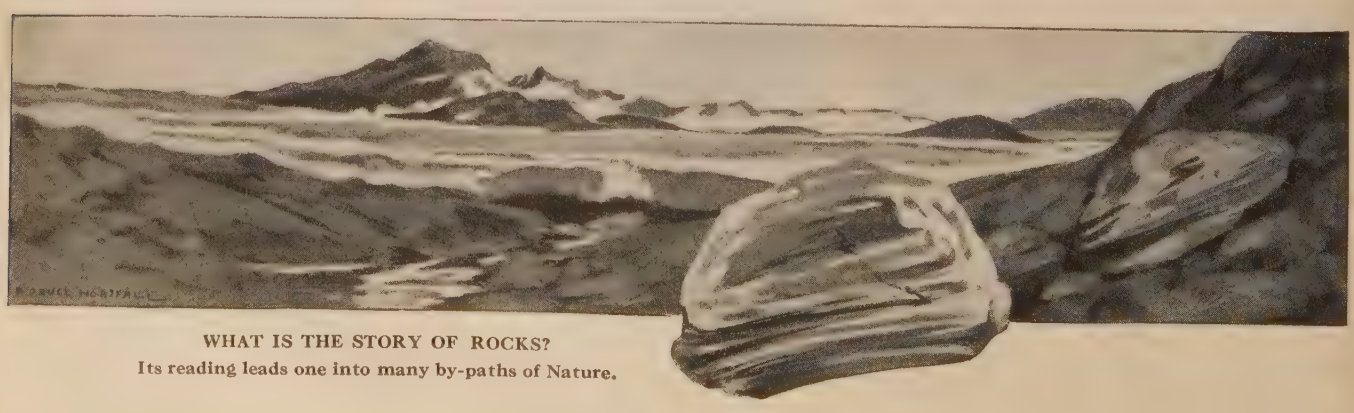
I mentioned earlier that May gave us Emerson, and for fear that I may neglect him and others whom May has offered to us, I want to say that those Nature lovers who can see nothing in Nature but birds; or nothing but wild flowers; or nothing but rocks; or nothing but any one other type of thing, would do well to read Emerson. Those who through training in formal school course think of Nature's secrets as being dry and uninteresting, like the specimens frequently studied, will find Emerson ready with other views on the subject.

NEW ENGLAND ASTERS
What is the story of its seed-bearing and germination?

Possibly the shaking-down which Nature can only too easily give any of us may in a way account for the hesitancy of some teachers to open the doors of Nature to their students. Ask any trained botanist how long it takes a New England aster to go from seed to seed or in how many of the weeds that grow in his own garden is the pollen sterile. Ask the average trained zoölogist to give you in fair detail the life history of fifty per cent of the salamanders of your region. Ask a few more questions and from then on you will not fear admitting to others that you yourself do not know. The period of time from seed to seed of our common weeds can be found by you as well as by anyone if you want to take it up and it will be a worth-while activity, possibly full of surprises. How many weeks does it take a germinating shepherd's purse seed to produce a plant with ripened seed? Will these seeds germinate immediately? What factors influence this time aside from the seed itself? If you are a botanist and feel that plants are all there is that is important, or a zoölogist who feels that animals alone are worthy of your attention, read Emerson again. You may not agree in all that he says in his "The Method of Nature," but you may find parts of it interesting. He says: "The method of Nature—who could ever analyze it? That rushing stream will not stop to be observed. We can never surprise Nature in a corner, never find the end of a thread; never tell when to set the first stone. The bird hastens to lay her egg, the egg hastens to be a bird. *THE WHOLENESS WE ADMIRE IN THE ORDER OF THE WORLD IS THE RESULT OF INFINITE DISTRIBUTION.*" Isn't there something there not to be found in the average school textbook of biology? How many of us cannot see the forest for the trees?

Horace Mann and Browning came into the world in May and led lives the knowledge of which cannot but help you in your Nature activities; but should I more than mention them here I could not do more than that for Agassiz; and if any man who has lived did more to encourage education through Nature than Agassiz he would be hard to find. It is interesting to follow his Nature interests about the world geographically and through what are now more definitely recognized as separate sciences. He became interested in fishes and, in order to know more about them, also became interested in fossil fishes. This awakened his interest in rocks, and from that he went on to problems in glaciation. But whatever he may have done in the field of learning new facts from Nature, he will long be remembered for the devotion and inspiration with which he inspired his students. His summer school on the isle of Penikese, with little or no equipment except an ideal natural setting, put to shame many of our modern summer schools that may be just as happily located but feel that books should be studied instead of Nature, that the only sermons come from the pulpit or lecture platform, and none from the stones that surround the auditorium in which the sermons are given.

You might like to go over some of Agassiz's experiences and learn to identify the frogs you hear in May by their songs. You might like to learn to read the story of a pebble through observing in a stream what conditions are necessary for the production of rounded



WHAT IS THE STORY OF ROCKS?
Its reading leads one into many by-paths of Nature.

pebbles, of grooved rocks and of other peculiar markings. You might like to study the topography of your own township and see if you can see where a river formerly ran, where a glacier passed, or where the waves of an ancient lake washed away the earth on its shores.

Nature students could well set aside May 28 as a Memorial Day in which they will commemorate the kindly personality, the industry, the courage and the example of method of Agassiz. He has left his stamp on the Nature movement. He helped free science from much of the slavery into which it had gotten itself and got people out of doors to the original Nature that Emerson said "wrote the past in characters of rock" as well as in other forms of Nature. We owe Agassiz a Memorial Day of his own.

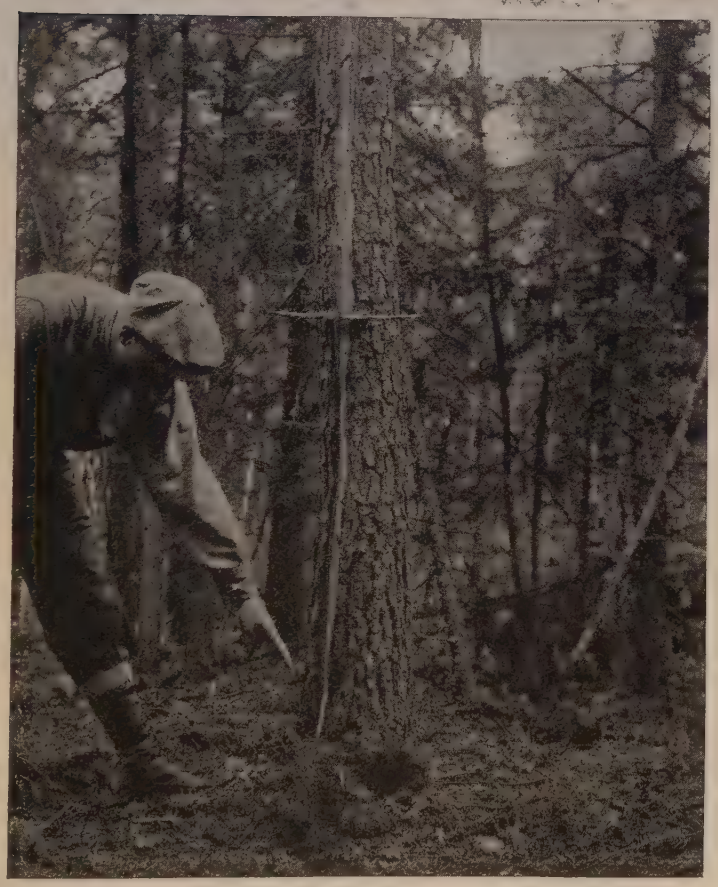
The spirit of adventure unquestionably leads or urges anyone who makes progress in his chosen field. That spirit did not die with those who have lived in the past. Surprise holds a prominent place in adventure and in Nature whose surprises offer us clean, healthy adventure.

Where Lightning Goes

By WALLACE HUTCHINSON

MANY persons have laughed at the story of the two men who on seeing a tree struck by lightning dug a great hole at its base to find the ball of fire they saw go into the ground. Yet that is exactly where lightning goes when it strikes a tree, and many a woodsman who has made a special study of this phenomenon will tell you that it does look like a ball of fire.

Lightning, when it strikes a tree, leaves its well-known mark in the form of a jagged gash of exposed wood, extending the length of the trunk, from which the bark is stripped as if with a gouge. It then usually travels a short distance out from the foot of the tree and disappears into the earth. But if there is an underlying stratum of rock close to the surface, the lightning may run along the top of the ground in an irregular line which resembles a shallow trench such as one would make by dragging a sharp-pointed stick over the leaves and needles of a forest floor.



THE PATH THE LIGHTNING LEAVES

This picture shows the strip down the bark and the man is pointing to the hole in the earth where the bolt entered.

Frequently, lightning sets fire to the trees it strikes, especially if they are old and decayed or have a dead and dried-out top. Only occasionally, however, does it "fire" the humus and debris of the forest floor, but there are cases on record where lightning has run along the ground for some distance and then jumped to a dead log and there started a fire in the punky wood.

In the mountain regions of our country lightning is a serious menace each year to many hundreds of thousands of acres of valuable timberlands. Of the fifty thousand forest fires which occur yearly in the United States almost one-third are started by lightning. In one national forest in the Pacific northwest this year, nearly one hundred and fifty lightning fires were started by a heavy storm in one afternoon with the resultant loss of many thousands of dollars worth of timber before they were finally extinguished.

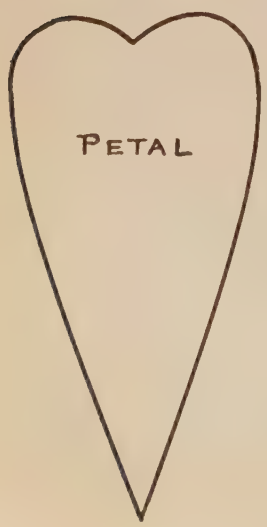
The old adage is that lightning never strikes twice in the same place, but foresters have found that in certain of the mountain regions of the West there are "zones" or "belts" where bolts from the sky strike with remarkable frequency and which have to be closely watched for fires during periods of heavy thunder storms. It is said that such phenomenon may be due in part to iron ores or other minerals in the ground which attract the lightning.

PICK THIS AND IT IS DOOMED
In a short while these beautiful flowers will wilt and droop as though in sadness

THIS DOGWOOD WILL NOT WILT
It is fashioned from crepe paper dipped in wax and cleverly made into real beauty

Through the activity of the wild flower lovers and in cooperation with many civic groups, Washington, D. C., rarely sees wilted and bedraggled branches of dogwood cast along the roadsides by those who have gathered not wisely but too well. The citizens of the National Capital are, most of them, educated to the idea that the dogwood should be left, in all its beauty, for others to enjoy. Other communities are doing similar work.

Recently, at a moment when the editorial mind was turning to the question of something about the dogwood for this issue, Miss Etta N. Schaeffer came into the office, bearing a branch of dogwood. It was not a branch that would fade because it was mere crêpe paper, and wax and wire. But it was beautiful. It developed that the bearer of the branch teaches the local representatives of the Dennison Manufacturing Company how to teach, in turn, those who would make many of the beautiful flowers that can be fashioned from paper. A lover of flowers herself, Miss Schaeffer had worked out the dogwood plan, and, feeling that it had a bearing on the Save-the-Dogwood campaign and a worthiness above any consideration of advertising, we asked Miss Schaeffer to give the members of the American Nature Association a lesson. The numbers refer to Dennison materials.



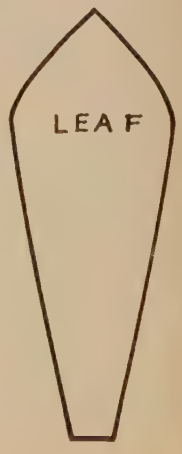
Materials required: No. 11 Crepe paper for petals; No. 46 Crepe paper for leaves and stems; No. 2 spool wire; Nos. 9 and 78 wires for branches; poppy and rose stamens for center. Wax solution: 1 pound of paraffine; 1 ounce spermaceti; one-eighth plumber's candle; patterns.

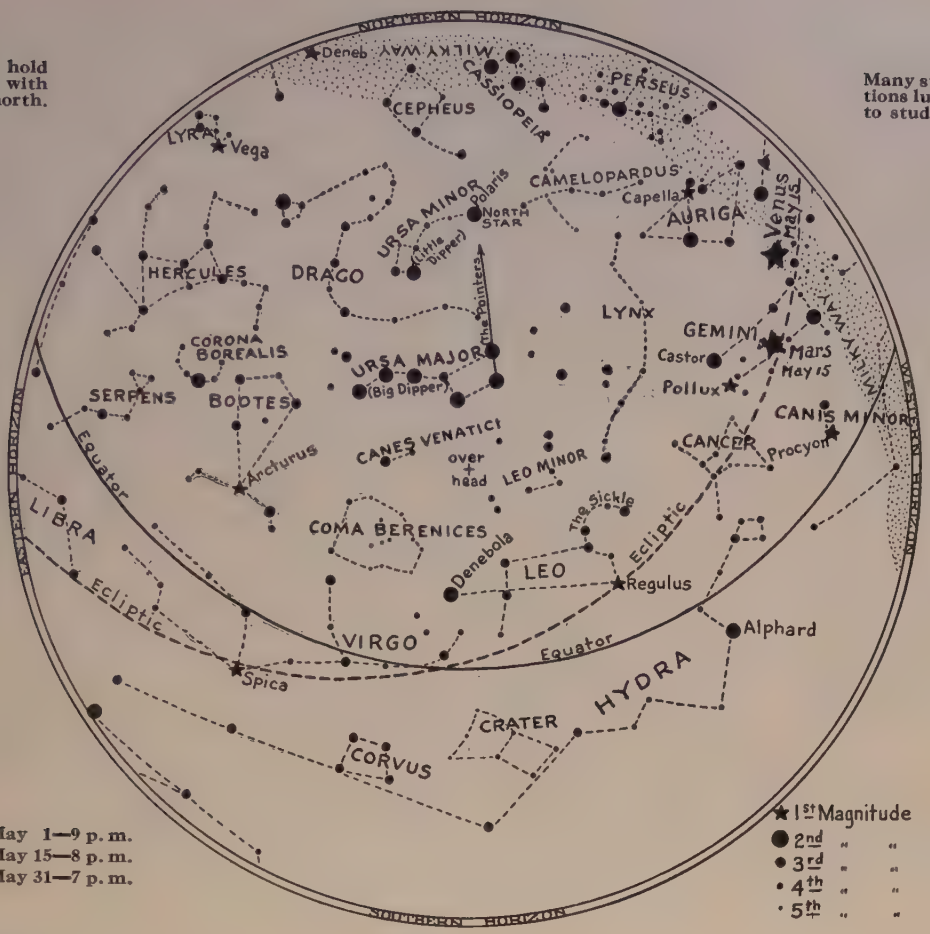
Cut across the grain of white crepe paper two strips each seven inches long and three inches wide. Paste the two strips together along outer edge. Place top of petal pattern on pasted edge. Cut four petals at one time. Fold a petal in half, hold the top outer edges with the thumb and finger of the left hand; with the thumb and finger of right hand catch the top at the fold and pull toward center fold. This makes the petal flute in the center. Tint this flute with black paper which has been dipped in water.

For flower center use poppy and rose stamens mixed. Place two petals opposite each other and then two others placed a little higher than the first two. Hold firmly and tie with a 7-inch piece of spool wire. Cut surplus paper from the calyx so there is not over half inch below wire. Cut strip of No. 46 crepe across the grain one-half inch wide, for wrapping stem. Stretch paper, wrap three times around calyx, pull on slant to wrap stem. A piece of No. 9 wire is inserted at base of calyx and is held in place by wrapping. The leaves are made double; two leaves joined with spool wire. Stem is wrapped like flower stems.

Flowers and leaves are then dipped three successive times in the wax solution. This is melted over flame and then removed as it will stay hot long enough to dip flowers and leaves for one spray. Keep a pan of water next to the wax solution and dip flowers in it after each waxing. The flowers are pliable enough to be reshaped if necessary after first dipping.

The flowers and leaves are then assembled on the branches. Cut a one-inch strip of No. 46 crepe across the grain of paper. Stretch and wrap over a No. 78 wire and hold the flowers and leaves in postion along the wire. The wrapping holds them in place. With a small brush, paint the wax solution on the branches.





Virgo and the May Skies

By Isabel M. Lewis

THE constellation of Virgo, The Virgin or Maiden, which is now visible in the southeastern sky in the evening hours is the largest of the twelve zodiacal constellations that lie in the path of the sun, moon and planets. Virgo may be easily identified by the peculiar Y-shaped grouping of its brighter stars with the brilliant white Spica at the base of the Y.

Virgo was known to the ancients both as the goddess of the harvest and as the goddess of justice. As goddess of the harvest she was known as Proserina, the daughter of Ceres, who was carried off by the god Pluto to the lower regions to become his wife but was permitted to return to her mother for six months each year.

The beautiful Spica represents the wheat-ear which Virgo holds in her hand as a symbol of the harvest.

As the goddess of justice Virgo was Astraea who lived on earth in the golden age of peace and purity. At the dawn of the silver age she left the earth but returned at eventide to visit those who still cared for justice and purity in an age in which these qualities were less appreciated than they had been in the Golden Age. When finally the Brazen Age ushered in a period of war, pestilence and violence she left the earth never to return. As goddess of justice Virgo may have been associated with Libra, The Scales, next to Virgo on the east, which are supposed to represent the scales of justice.

Spica is the only first magnitude star in Virgo and to the Arabs it was known as The Solitary One because of its isolated position. Arcturus, the nearest star of the first magnitude, is some distance away to the north of Spica.

Spica, which is known also as Alpha Virginis, is a spectroscopic binary star, that is, it is made up of two stars so close together that they appear as one star even when seen through the greatest telescopes. But the spectroscope, which spreads the light of a star out into a spectrum of colors like the solar spectrum, except that it is very much fainter and narrower, tells many interesting things about the stars that cannot be learned from the use of the telescope alone.

The spectroscope tells us that Spica is composed of two stars and it shows the spectra of these two stars. It is known that the two stars are only about eleven million miles apart and they revolve around a common center in four days so they must be spinning around each other like two gigantic tops at a terrific speed. How strange it would seem to have, in place of our solitary sun, two such rapidly whirling bodies at the center of our solar system! Spica is a giant sun several thousand times more brilliant than our own sun. If the sun and Spica were placed close together at a distance of about thirty-three light years, or about two hundred trillion miles, from the earth, our sun would appear to be only a very faint star of the fifth magnitude but Spica would be nearly as brilliant as the planet Venus. The distance of Spica from the earth is estimated to be about two hundred and fifty light years. That is, the light of this star takes two hundred and fifty years to reach the earth travelling at the speed of 186,000 miles a

second, and if some great catastrophe should suddenly overtake it two hundred and fifty years would pass by before we would know anything about it. During all that time light rays that had left the star before the catastrophe would be coming to us through the great expanse of space that separates us from the star Spica. A number of the twenty brightest stars appear more brilliant than Spica because they are nearer but only a few of them surpass Spica in actual brilliancy and splendor.

Among the most conspicuous constellations in view this month we find, in the east, Boötes, Corona Borealis and Hercules; in the west nearing the horizon, Gemini and Auriga; and in the south the huge constellation of Hydra, The Water-Snake,, which with its riders, Corvus and Crater, covers all of the far southern sky from a point in the southwest below Cancer, where a group of faint stars marks the creature's head, to a point close the the southeastern horizon. The brightest star in Hydra, a star of second magnitude known as Alphard, lies far over in the southwest in a lonely position.

THE CONSTELLATION FOR MAY
It lies across the meridian slantingly, hence the apparent difference in the directions shown.

Above Hydra we find Leo, now passing to the west of the meridian, with Denebola, the star that marks the tip of the lion's tail, nearly due south. Next to Leo on the east is the large constellation of Virgo and directly above the opening in the Y that is formed by the brighter stars in Virgo lies Coma Berenice, or Berenice's Hair. This constellation is composed of a great number of faint stars closely crowded together that give the effect of a faint veil of filmy light thrown across the heavens. This region and that included within the Y of Virgo, which appears rather uninteresting to the unaided eye, is thickly studded with faint and far distant nebulas that may possible be great universes of suns, faint because they are at inconceivably great distances from us. To the astronomer this is one of the most interesting regions in the heavens, a treasure mine of wonderful and mysterious objects.

Due north at this time, above the pole, we recognize the familiar Big Dipper in ursa Major and Draco the Dragon, his tail lying between the bowl of the Big Dipper and the North Star, Polaris, and his head far over in the northeast beneath the foot of Hercules.

Two of the planets are visible at this time in the western sky—Venus and Mars. Venus passes from Taurus into Gemini this month and is by far the most brilliant object in the west, after sunset. It is increasing steadily in brightness and by the end of May does not set until more than three hours after the sun. Mars is now scarcely brighter than a star of the second magnitude and is passing eastward through Gemini. By the end of the month it will be only a few degrees south of Pollux and quite inferior to it in brightness. It will be easily recognized by its deep red color.

Saturn is now in Scorpio a little north of Antares. Although not visible at the time for which the chart is prepared it will soon appear in the southeast and on the 26th of May when it comes into opposition with the sun it will rise at sunset and be visible through the night.

To see Jupiter one must be up before sunrise for this planet is now a fine Morning Star in Pisces. Mercury will be too close to the sun throughout the month to be seen. On May 20, it will be in superior conjunction with the sun, directly behind on the far side of its orbit from Earth.

HINTS and HELPS for HOME and GARDEN

May

THE plants which you ordered from the nurseryman are now arriving. Don't leave them out in the sun. If they can not be set out immediately, be sure that they are kept damp and place them in a cool dark place.

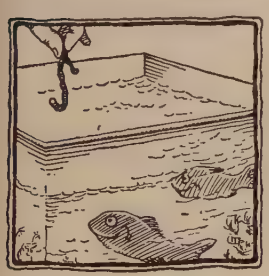
Now is the time to prevent black spot and mildew on your roses. These diseases cannot be cured when they once start, but they can be prevented. Use a dust spray of nine parts dusting sulphur to one part arsenate of lead. Apply this early in the morning while the leaves are still damp with dew, and keep up the treatment every few weeks.

Have you ever draped pieces of string and shreds of cloth on your shrubbery? The birds will make instant use of them in building their nests. It will give you much amusement to watch the struggles of some bird to detach a very long string which may have caught around a twig.

If you have any wild cherry trees on your place, you will find that in spite of your efforts to destroy tent caterpillar eggs, it is probably host to squirming hundreds. The only effective cure is to harden your heart and cut down the tree, as the wild cherry is the main dwelling place of these pests.

A reader suggests that burning the old leaves of the iris to destroy the eggs of the borers is not effective. We now learn that a moth which flies in May deposits its eggs on the foliage and a thorough search among the leaves and stems from May until July will reveal the grubs which may be removed by a sharp knife. After July it is too late as the grub will then have reached the rhizome and the rot will have set in.

An ordinary pruning knife is very useful in separating dahlia roots. If all danger of frost is over, plant the roots out by the first of May, being very sure not to plant them too deeply. Four inches is usually sufficient for both dahlias and gladiolas. Deeper planting weakens the growth.



Liquid manure is a splendid fertilizer. The easiest way to handle it is to place the manure in an old burlap sack and immerse the sack in a barrel of water. Let it soak for twenty-four hours, when it will be ready to be used. When it needs renewing, water can be added several times before the manure will need to be replaced.

A small garden must be planned with a view to economy of space. Soak corn and squash seeds in water before planting to quicken germination, and place the squash among the rows of corn. Small garden bush beans can be planted two inches apart instead of the four inches usually prescribed.

Give your goldfish a treat by feeding them a few of the angle worms which you uncover in digging in your garden.

If you have sufficient garden space, place the rows far enough apart to allow cultivation by a small hand cultivator. This saves a great deal of time and will give you a head start on the weeds which are crowding out the struggling seedlings.

All of your hardy annual flowers should now be planted, and every vacant spot in your garden accounted for. Wood ashes kill insects and may be sprinkled on the ground around both the annuals and perennials.

Chrysanthemums must not be forgotten. Plant them now and they will bring beauty to the garden after the other flowers are killed by frost. As a cut flower they last a long time in the house.

Remove the runners from the old strawberry plants which are to produce berries so that the strength of the plant will be confined to supplying a good crop of fruit. Runners taken from strong plants may be potted and grown in their pots; then when the first crop of peas is finished, plant them out in rows a foot apart. Some people have had success planting the runners in a row between the rows of old plants, later on digging up and throwing away the old plants. This saves space and keeps the strawberry plot in relatively the same position for two years.

In cutting the German iris for bouquets, you can gather the sprays when the buds are just beginning to show some color. These buds will open in the house and will last longer.

If you have any apple or plum trees in odd corners of your garden, be sure either to cultivate the soil around the base to preserve as much moisture as possible, or, if this is not possible, place a mulch of grass clippings under the tree, being sure to leave the space around the trunk free in order not to encourage mice to forage and nibble at the bark.

Another use for grass clippings is to place them around the strawberry plants to keep the berries clean and free of earth.

Prune the evergreens and hedges this month before the new growth has started in earnest.

PHOTOGRAPH R. W. WESTWOOD

THE DESTINATION OF THE AMERICAN TREE SEED
Forestry school at Les Barres in Loiret, France, where the seed are sent for distribution to the nurseries.

SEEDS OF FRIENDSHIP

By ELBERT FRANCIS BALDWIN

DURING the war there was ghastly devastation of French forests, first by the Germans, not only in obtaining necessary supplies for the military purposes but also in deliberate destruction. For instance, at Pont-a-Mousson, near Nancy, I have seen the very soil mined to a depth of six feet. In addition, in their own need of supply, tribute had to be imposed on the forests by the French, English and Americans in Great Britain, France, Belgium and Italy. An American saw the possibility of aiding in this work by contributing large quantities of American tree seeds for planting on the devastated areas. He is Mr. Charles Lathrop Pack of Lakewood, New Jersey, President of the American Tree Association and Chairman of the Board of Directors of the American Nature Association.

He has donated hundreds of millions of seeds, chiefly of Douglas Fir, to these countries since the war and it has been my pleasure recently to view some of the results of these donations to France in the form of more than half a million Douglas Fir trees growing on devastated areas in the battle regions.

Nineteen out of every twenty Americans in France may probably be found in Paris. The sojourner in this city need not go far to find evidence of Mr. Pack's generosity. He need travel but to Versailles, or, beyond, to Rambouillet. At Versailles there are now about four thousand of our Douglas firs and at Rambouillet some three thousand Lawson Cypress and two thousand *Pinus radiata*. Of the two places Rambouillet is the more impressive; it is more "the real thing." Its nursery is in the very heart of the forest.

PHOTOGRAPH R. W. WESTWOOD

A LIVING AMERICAN MONUMENT
A pine growing from American seed at the National Aboretum at Les Barres.

At Rambouillet I happened to arrive at the Inspector's lodge, by the lake, just when a hunting party emerged from the wood, some twenty men in brilliant scarlet coats and black velvet caps with long visors. There were half as many women, also in red coats but with three-cornered velvet caps. They were shortly joined by that indefatigable huntswoman, the Duchesse d'Uses, eighty-odd years old. She no longer risks riding to hounds but follows all possible hunts in her carriage. *In,* do I say? She herself drove as she sat up on the coachman's box with him. The horses acted as if they liked it. Meanwhile the stag had plunged into the lake and was swimming across. All looked as if they wanted to give the animal a good chance. Seemingly with the spring of a girl, the Duchess got down from the box and walked about in her high-top boots and hunting hat, and with a chirpy word for everyone. The pack of, say, forty dogs, was yelping, impatient to be off, when there came the

tooting signal and away went the hunters and dogs— a gay sight, all for the life of one poor panting deer.

The Inspector and I then drove a mile in another direction to his nursery of infant trees. As we were inspecting the neat rows of American seedlings, he held up his hand at a certain faint, far-off sound and said: "Il est mort, Monsieur." He did not need to say who "Il" was—the poor stag.

Though the seeds have been distributed among some twenty French forests, by far the most vivid impression of the result of the gifts is obtained along the war frontier, between Valenciennes and the Vosges mountains. The devastation is, of course, much more evident on this frontier than elsewhere and hence the need for reforestation the greater. All the nurseries and forests are far enough from a railway station as in practically every case to make it necessary to visit them by motor from such centers as Valenciennes, Charleville, Sedan, Nancy and Luneville.

The Germans worked their will especially in the forests to the north of Valenciennes. St. Amand and Wullers were entirely destroyed. Nearly half has now been reforested. The forest of Marchiennes was not so much devastated and the larger forest of Mormal to the south, still less. Marchiennes has some fifty-five thousand Sitka Spruces and Mormal about sixty-six thousand American trees, mostly Douglas firs. All seem doing fairly well. It was a satisfaction to see them there, for these forests need pine. There is too much hardwood growth. Trebly significant then is the gift. It is a proper gesture in preserving forest balance; it creates a mute but eloquent protest against inhumanity; it builds equally eloquent monuments to a far-sighted giver.

AMERICAN TREE SEEDS READY TO SHIP
Dwight Davis, Secretary of War, accepts a bag of seed from one of the members of the Association's staff.

Towards the end of 1914 the Germans entered this region. They did not leave till more than four years later, just before the armistice. Their going was hastened by the gallant New Zealanders who delivered Le Quesnoy, the chief town near Mormal forest. It is a picturesque, red-bricked, walled place looking now, I dare say, just as in the days of Margaret of Burgundy. It is the perfect type of an old fortified town, as you will say after driving across the moats of its double line of walls. I noted the spot where the New Zealanders scaled the stout ramparts. One reads on a tablet: "In honor of the men of New Zealand through whose valor the town of Le Quesnoy was restored to France, 4 Nov. 1918."

In the Mormal forest is a clearing and there are the inspector's and guard's houses. I stopped at both for a chat. There is also the hotel "La Chenaie," a solid structure adapted for a sojourn and amid better air than that of the surrounding lowlands.

Now further south. Whether in France or in Belgium (and it extends into both countries) the Ardennais has always been a marked region. Here is where the lowlands, rolling to the sea, lose their flat monotony and become broken up into hills. Through them the Meuse finds its way. Equally with the Lorrainers, the Ardennais seem to typify the tendency to unhurried, balanced opinions, not always to be found in the capitals to the east and west. This quality characterizes most of the inhabitants of ancient Lotharingia. Many centuries ago a wise king created this buffer state between French and Germans. What would Belgians, Luxumbergers and some Hollanders, Ardennais, Alsatians and Lorrainers say to find themselves back where they were once?

Inspector Martin and his aides at Charleville gave me necessary information and opinions, and I set forth for the Cerceaux and Neuville nurseries near Montherme, the first with about eleven hundred, the second with some fourteen hundred little trees. All seemed doing well. These nurseries are alongside the great Chateau Regnault forest into which the transplantings will be made by Brigadier Osslet and Garde Sermonnet.

Then further south to Sedan. There are seventeen hundred Douglas firs in the Robbessart nursery to the north of Sedan and nearly eleven thousand in the Mont Dieu nursery to the south, seven hundred having already been transplanted into Mont Dieu forest. All seemed in tip-top shape. M. Coulaux, the excellent inspector at Sedan, had sent his aide, M. Garral (who gloriously

bears the marks of war) to call the Brigadier, and I was thus well accompanied during the round trip of twenty-five miles. The Brigadier, the guard and I went up into the forest, the guard, with lightning speed, jumping from one little Douglas to another. They carried their sturdy heads as high as possible, just as if to say that the next time Germany wants to declare war on France, a thought of America might be in keeping.

Now to Nancy. One visits the forestry school, of course, the first in France. The buildings stand about a charming garden. Beside ample lecture-rooms and offices, they contain a splendid collection of the woods of the world. The young French foresters come from army service as lieutenants. I liked their looks and it was encouraging to see among the sixty-odd students some foreigners—Czecho-Slovaks, Bulgars, even Chinese. Professors Crestin and Noisette and the efficient Inspector, M. Henriquet, were most kind and cordial in facilitating my visits to nursery and forest.

The school's nursery is at Bellefontaine, five or six miles out of town to the north, and the Forest of Eliaux, where there are some thirty-one thousand Douglas fir plants, is from Luneville, a very much longer distance to the south in the Vosges.

The Bellefontaine nursery is certainly the most charming I have seen anywhere, but the American trees have now all been transferred to the distant forest. As I stood on the hill in front of Brigadier Cochinet's house, in its woodsy setting, and looked across the nursery's trim green slopes to where, in the distance, the sun was shining full on an enormous reservoir, the beauty of the scene and of similar scenes, and thus the beauty attendant upon the profession of forestry, was again borne in upon me. I wondered why more men do not enter upon it. More are, indeed, our forestry schools show.

The evidence of sowing of American seeds in foreign soil fills me with pride. They are the outward sign of recognition of a historic Franco-American friendship. Who can visit the French forests without feeling glad that we are now represented in them, not by some cold marble tablet of chronicle of our aid in 1917-18, but by a warm, breathing, living American tree?

A Nature Puzzle

By Florence H. Moore

I am a large, ruminant mammal, found now principally in remote districts of Africa and Asia. (Better look up the meaning of the big words in the dictionary.) It is said of me that I am the tallest of quadrupeds, (look that word up too,) as I do not need a step ladder to gather the most juicy twigs and leaves, which is my main food, sometimes as high up in the air as eighteen feet. And now I think I have you guessing as to what I am. You'll find me in the picture though, also the letters of my name. Write them down as you find them, then assemble in order. Where letters repeat, only one is given.

Answer to April Puzzle
LION

NATURE EDUCATION

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Making an Indoor Nature Trail

The following suggestion, which may easily be adapted by Nature teachers for at least occasional classroom use, comes from Dorothy Johnson of Omaha, Nebraska:

Many Camp Fire Girls have a hard time earning Nature honors during the winter. Many summer camps use "Nature Trails" to help the Nature students. An indoor "Nature Trail" may prove very helpful during the winter.

Issue invitations to a Nature party. If written on real or imitation birch bark they are attractive. Almost any attic, basement, garage or suite of rooms may be used for such a party. Those in charge should visit the woods to get whatever out-door specimens they can find, such as bark, fungi, cocoons, moss and the like, for the "Nature Trail." The camp collection of Nature material should also be used, including mounted insects, bird and animal pictures, star maps, bark, etc.

Tags, similar to those used on the out-door trails, naming the specimens and calling attention to the distinguishing characteristics, should be attached. The tags must be numbered, and a correct list made for reference.

The guests should be given a limited time for observation, then taken to another room to play Nature games, or hear Nature stories, while the tags are being cut from the specimens, leaving only the numbers. Pencils and papers are then provided, and the guests are asked to write the names of as many objects as they remember. A Nature book, or subscription to NATURE MAGAZINE, is an appropriate prize. If the party is well arranged, a guest may have earned one to four honors during the evening. As a game it proves infectious and its players are enthusiastic.

WHO'S WHO IN NATURE STUDY

Lester J. Ivins

Twenty-five years ago Lester J. Ivins was in his college student days preparing for life work. He became much puzzled to discover the large proportion of otherwise intelligent individuals who knew nothing about the simplest things in Nature. This fact piqued him and he concluded that the difficulty was the lack of proper instruction in this field. Thus, with a background of boyhood on a farm, and training in Science and Agriculture, he set out to do his part in improving the quality and quantity of Nature knowledge, and is today the head of the Department of Nature Study and Agriculture at Kent State Normal College, Kent, Ohio.

Simplicity has been the keynote of Professor Ivins' teachings and writings during the quarter century in which he has contributed largely to Nature education. During these twenty-five years he has held several important posts in Ohio Nature and Agricultural work as well as being regional director of school gardens for the Central States under the U. S. Bureau of Education. His Nature Study texts have had wide circulation.

Tree Year in Camp Fire

The year 1927 is Tree Year for the Camp Fire Girls. All over the country, girls are already making their plans for actual constructive work in tree planting and tree conservation. The program which has been prepared by the Department of Outdoor Health Activities, is varied and inclusive enough to give opportunity to all girls in all sections of the country to take part in this tree service to their country.

The idea of those who are directing the program is that the enthusiasm and interest is not to be allowed to burn up quickly, but will continue over a period of years, so that the Camp Fire forests and various tree activities, which were started, will be watched and cared for by girls for a number of years, until they are on a lasting basis. This tree program has attracted interest all over the country.

The entire January issue of *The Guardian,* the monthly publication for leaders, has been devoted to explanation of this program. A cooperative agreement has been drawn up between the Camp Fire Girls and the U. S. Forest Service.

Besides the practical side of tree activities, the Camp Fire Girls have been making an anthology of tree poems. Their magazine, *Every Girl,* is carrying on the following contests:—Tree Photographs, Drawings of Trees, Tree Poems, and Tree Stories.

Nature Council Meets

At the meeting of the National Council of Supervisors of Nature Study and Gardening held in Dallas, Texas, Professor E. Laurence Palmer was elected president and Professor Hanor Webb, secretary-treasurer. A progressive program was followed out by the meeting, which was held in connection with the N.E.A. meeting.

Nursery Nature Tales

BEING THE ADVENTURES of TOBY & BETH
TWO VERY LITTLE PEOPLE IN THE BIG WORLD

What Spiders Spin

By Elizabeth K. Peeples

"THERE'S a fairy curtain!" cried Toby pointing toward the roof of the attic where he, mother, and Beth had gone to search for treasures.

"I see the fairy who made it," replied mother.

"Why, it's only a cobweb and a spider," said fat little Beth, "and it's all dusty."

"We could not see it, if it were not for the dust, dear, it is made of such fine threads. Let's watch it."

As they stood watching the cobweb a fly came buzzing through the attic. The spider disappeared. She had gone into her little den alongside the web. On came the fly. "Buzz" he went blundering into the web; and then as his legs and wings were caught in it, "Buzz! Buzz!" What a fuss! But only for a second! Out rushed the waiting spider. In a twinkling she had sucked his blood, and only his empty shell was left hanging in the silk threads.

"The ogre!" cried Toby his dark eyes round with excitement, and all his curls on end. "What are those round things hanging in the web? Has she eaten them too?"

"Those are the nests she has spun for her eggs."

"They aren't like hen's nests," said Beth.

"Will little spiders come out of the eggs?" asked Toby.

"Let's watch the nests every day to see," mother suggested.

"I saw a spider web out in the garden, but it wasn't like this. It was shaped like a funnel." Toby was talking fast.

Out in the grass they found the funnel web, but no spider could they see until Beth gently touched one of the tall grass blades to which the web was fastened. It trembled a bit and a spider appeared from out the silk tunnel.

"She thought I knocked at the door," said Beth.

"She thought something good to eat had walked into the web, little goose," said Toby, looking very wise. "See!"

He shook the web, but presto! the spider was gone, down the tunnel and out the back door.

"You've lost my spider" wailed little Beth.

"Well it was our turn to frighten the spider away," explained Toby. "You know what happened to little Miss Muffet."

"Oh, come here, Beth," he cried joyfully. "Never mind your old spider. Here's the best one of all."

And there, sure enough, stretched between the branches of a rose bush was a web like a wheel of fairy lace. It had a hub and spokes of strong silk, laced together with lines of finer silk strung with tiny drops of sticky something that shone like diamond dust in the sunshine.

"So pretty, but do they all catch the poor flies?" asked Beth, as another unlucky fuzz-buzz flew straight into the beautiful trap.

"Flies, mosquitoes, bugs, and grasshoppers," said mother, "but the spiders are much better friends of ours than those creatures."

"Where do they get their silk?" asked Toby, with great interest.

"They spin it out of their own bodies," his mother answered.

"Then I know they are real fairies," said Toby. "I am going to watch until I see one do it. That should be great fun."

A GREAT MIND—CHARLES DARWIN

By Donald Culross Peattie

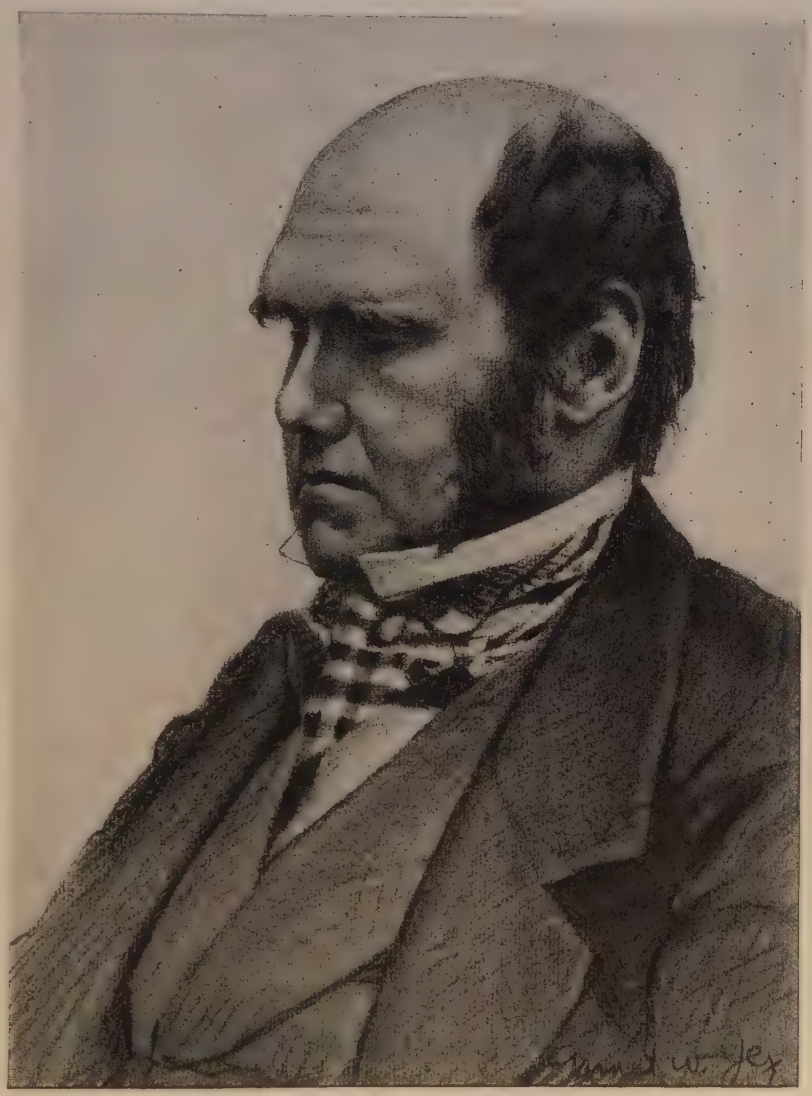
(Illustrated by Garnet Jex)

A BOY who was so deep in thought that he walked off the edge of a bank seven feet high, must be either the village idiot or a coming genius. As it chanced Charles Darwin was the latter, when he did that foolish thing, but his family was not sure he was not the former. His father told him, "You care for nothing but shooting, dogs, and rat-catching; you will be a disgrace to yourself and all your family."

His father did not really believe this, but there is no doubt that young Darwin was half the time in a brown study, the other half up to boyish pursuits like bird-nesting, and pheasant-shooting (he was afterwards ashamed of his love of hunting), and from the first he had the collecting mania, which drives parents to despair. In some boys the rage for collecting takes the form of amassing hordes of postage stamps; with others it is specimens of rocks, seeds, eggs and other natural history objects. The latter sort Darwin had, and very useless it seemed to his tutors and elders. He liked to tinker with chemicals, too, and for that reason was nicknamed "Gas" by other boys. One of his teachers publicly rebuked him in class for wasting his time on science.

With the idea that Darwin might become a doctor he was sent to Edinburgh, where he attended all science lectures and found them so dull, so full of medieval superstition, that he either went to sleep or walked out in disgust. Darwin says that at the most he never had more than a dozen patients, and finally throwing off the pretense of pursuing a medical career he went to Cambridge University to study natural history.

There it was that he formed his first friendships among other scientists, and from the first he was fascinated by what geology offered as a field for imaginative science, for Darwin's mind was as imaginative as a poet's. How far he differed from other scientists of his day who were apt to be dry and literal, is shown by the fact that he called the attention of Sedgwick, then England's chief geologist, to a tropical shell found in a pit near Darwin's home in Shrewsbury. Sedgwick said (probably rightly) that it must have been thrown there by someone, but he added, to Darwin's amazement, that it would be a terrible misfortune to geology if it should be found that it actually belonged among the rocks of the pit, as it would upset all notions of geology of that day. Later, Darwin actually did find arctic fossil shells in that same pit, but by that time Darwin himself had upset all notions of all the natural sciences.



CHARLES DARWIN, 1809-1882
From a photograph taken in 1854 and published in "More Letters of Charles Darwin" by Maull and Fox.

Darwin, without ever in his life engaging in any heated controversies, fought for scientific liberty of conscience, as others have fought for religious liberty.

Darwin admits that he failed, as Sedgwick did, while they were on a walking tour in Wales, to notice the plain evidences of the passage over that country of the Great Glacier. "We spent many hours there," he said, "examining all the rocks with extreme care . . . but neither of us saw a trace of the wonderful glacial phenomena all around us; we did not notice the plainly scored rocks, the perched boulders, the lateral and terminal moraines. Yet these phenomena are so conspicuous that . . . a house burnt down by fire did not tell its story more plainly than this valley." Partly then, because of the depressing mental influence of the old-style scientist by his side, partly because his mind was on pheasant-shooting, Darwin just missed a great discovery the honors of which were to

be won by Louis Agassiz. Such are the turns of Fate.

But Darwin's great days of discovery were at hand. By good fortune, and against his father's advice, he went on a voyage of exploration in the ship *Beagle*, traveling all over the world, touching on nearly every continent and important island. Though in after years illness prevented Darwin from leaving England, almost from leaving his home, the sights he saw, the facts he gathered, the inspirations that came to him on this voyage, lasted him all his life and enabled him to write his fascinating books from his bed or his desk at home, looking out on a quiet country landscape in England.

It was on the weird Galapagos Islands, off the coast of South America, that Darwin's curiosity and imagination received, quite literally, their greatest thrill. A less imaginative or inquisitive man might have noticed what he noticed, namely, that on each island the plants and animals differed a little from each other, and all differed a little from related plants and animals of South America, without asking himself why this was so. To Darwin it seemed obvious that different conditions on different islands had caused plants and animals, originally of the same sort, to vary a little, and that was the germ of his great theory of evolution. When he returned to England he opened his notebook and commenced to write down his first thoughts on this subject, and kept silently at it for twenty years before he was ready to disclose his new ideas.

The idea of evolution was not new. Aristotle, the old Greek naturalist, had it; Darwin's grandfather, Erasmus Darwin, whose writings Darwin had read without any lasting mental impression, contained the germs of Darwin's ideas. The great French naturalist, Lamarck, had already announced a theory of evolution that all his life struck Darwin as ridiculous. Rafinesque, an American scientist whose greatness people are just beginning to realize, had expressed some of Darwin's ideas and been hooted at. But Darwin did have a *new* theory of evolution, and one more reasonable than any that had so far been offered.

His belief that local conditions had made one kind of plant vary until it became several kinds, in the case of the Galapagos Islands, was strengthened when he began to study the history of common domestic animals, horses, dogs, and cats, and of plants like wheat and barley, and the garden flowers. He saw that mankind, by selecting and breeding the animals and plants that were most advantageous to his needs or ideas of beauty had so changed domestic animals and crops and flowers that they were now hardly to be recognized as descendants from their wild ancestors. Dogs, which have mostly been derived from one species of wolf, have been bred into so many different kinds that it is almost incredible that the dachshund, the collie, the spaniel and the greyhound were once alike, yet they were. These ideas, and the idea that the struggle for existence would eliminate all animals and plants unfitted to survive in the keen competition of this old world, and would bring to the foreground all types that by hardiness or speed or cleverness could get on in life, enabled him to form his great theory of Natural Selection.

As it happened, Darwin did not discover this idea alone. His friend Wallace, then far away in the Pacific Islands, wrote him a letter telling of a new theory of his, which proved to be Darwin's own ideas. Both men agreed to let the other have the credit, but in the end they presented their first lectures on the subject together. These were given before an audience of conservative scientists, and nobody present realized the greatness of the words to which they were listening. Not till Darwin published his book, "The Origin of Species," was a sensation really created.

Darwin was at once attacked and called all kinds of mannerless names, both by scientists and by people who were utterly unscientific but nevertheless had made up their minds on the matter. His friends defended him hotly and brilliantly though sometimes over-zealously. Darwin, a gentle and tolerant man, never entered the discussions, and no matter what unjust things were said against him, was never stung into an angry reply.

Nevertheless it was he who revolutionized science in the last Century and liberated natural history from the iron rule of reverence for its old-time masters. As it chances he was born on the same day, almost in the same hour, as another great liberator, Abraham Lincoln. Their birthday was February 12, 1809.

So much heated excitement has centered around his theory of evolution that we are apt to forget his other works by which he set more store than some of his books on evolution. His range of subjects included the power of movements in plants, insect-eating plants, the formation of coral reefs, the fertilization of orchids, expression of emotions in men and animals, and many other subjects. He even wrote a book on the formation of vegetable mould in which he took a subject as lowly and seemingly dull and undignified as the common earthworm and made it fascinating. No scientist except Henry Fabre was ever able to hold the attention of readers of all sorts, even those not disposed to be interested in his subject, as was Charles Darwin. He always said he had no literary style, but as a matter of fact he had the finest gift a stylist can have, the power of writing with absolute clarity and immense enthusiasm that sweeps you along as you read. Darwin had had one taste only of strange exotic life, but he could take the common little wayside weeds of the English countryside, that most people, even great scientists, have thought too trivial for notice, and make great discoveries in the study of them, and bring them vividly to the reader. His long life proved over and over again that any one, located anywhere, has a chance to make momentous "finds" if he will look for them. And these can still be made.

In recognition of the prevailing interest in biography, NATURE MAGAZINE *inaugurated a series of biographical sketches of naturalists of the past, of which the foregoing is one. The Editors would appreciate any expression of opinion from readers as to the value of this series and their interest in it, or lack of interest.*

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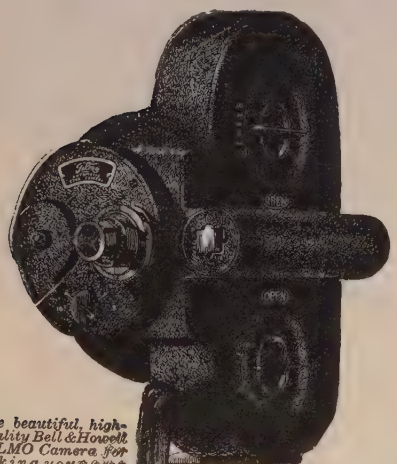

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State Park Meeting

One of the most notable phases of the development of the outdoor movement has been in the direction of the creation of State parks. The achievements in this direction have been significant and far-reaching and no little is due to the active work of the National Conference on State Parks, ably led by Judge John Barton Payne and Stephen T. Mather. The Conference includes many forward-looking individuals and groups and has proved itself a vital force in the span of its comparatively brief existence. The increased importance of the State park movement and of the organization, also, attaches added interest to the seventh annual meeting of the Conference to be held in the Palisades Interstate Park, New York, May 17 to 20. Any information about the meeting may be obtained from the office of the National Conference on State Parks, Union Trust Building, Washington, D. C.

Dr. W. H. Dall Passes

It is with sadness that we must record the passing of Dr. William Healey Dall of the Smithsonian Institution, one of our country's foremost authorities on mollusks and the life of the sea. His was a career devoted to the cause of science and covering a span of 82 years, filled with achievement and scientific honors. He wrote widely in his chosen field and it was the distinct privilege of Nature Magazine to publish one of his last pieces of writing, a biography of Spencer F. Baird, which appeared in our February issue.

For Women's Clubs

Women's clubs have been one of the most influential factors in aiding the movement toward general public appreciation of the conservation and forestry problems. In recognition of this signal work the United States Forest Service announces the publication of A Forestry Program for Women's Organizations. It is designed to present just what its title suggests and has been prepared by Mrs. Lillian T. Conway of the Forest Service. Copies may be obtained by writing to the Forest Service, Department of Agriculture, Washington, D. C., and requesting Miscellaneous Circular No. 91-M.

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Dodson Scientific Wren House as shown at Left.

The Silver Throated Wren is one of our sweetest singers. A four-compartment house satisfies their habit of changing nests for each of their three broods. Beautiful design, made of oak, finished in green with cypress shingles, copper coping, comes complete with rust-proof snap-on hanger. Size 28 in. high by 18 in. in diameter. *Price* **$7.00**

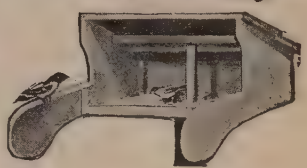
Dodson Scientifically designed and artistic bird houses are a feature in the most beautiful estates, country clubs and parks all over America.

Queen Anne Martin House

of 48 rooms. This beautiful house with its specially ventilated garrets, porches and other patented details has proven a sure lure for these most useful and fascinating birds. A large house size 36x26x37 inches; copper roof, including 22 ft. easy raising and lowering pole only **$60.00.** Others as low as **$18.00.**

Flicker House

Is a sure lure for these very useful birds. Trees in cities are so well taken care of that Flickers have difficulty in finding homes. They, therefore, take very readily to Dodson's Scientifically Built Houses. Flickers are one of the most useful birds, destroying moths, tree pests and principally ants on trees and ground. Many letters have been received stating that ants have mysteriously vanished since these birds have found homes. House 26½ in. high by 12 in. in diameter. *Only* **$7.00.**



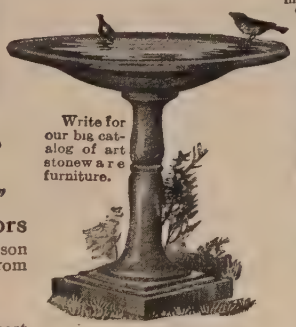
Automatic Feeding Shelter

stocked with a few simple foods (as described in free book). Lures songsters from the whole neighborhood. Automatically revolves like a weathervane to protect birds from storms. Everlasting redwood, finished in green. Size 24x22x12 inches including 8 ft. pole **$8.50;** with copper roof **$11.00.**

Why Dodson Houses Win the Birds

For more than 40 years Mr. Dodson has experimented and studied every little detail which, although seemingly insignificant, is vital to the approval of each fastidious species of songster.

A Song Bird Lover
for over 40 Years
ACTUAL PHOTO OF
Joseph H. Dodson (The Bird House Man)
Making friends with a Black Capped Chickadee at his Kankakee Bird Sanctuary



Write for our big catalog of art stoneware furniture.

Bird Bath

This handsome stoneware bath is not only an ornament to any garden but is the only one where knowledge of the birds' habits, fears and preferences have been considered in designing a bath that the birds enjoy and use. Complete with 32 in. stand. *Price* **$26.00;** without stand **$14**

Bluebird House

The happiest and most beloved Songsters. Dodson's Scientific houses satisfy these most exacting birds. Made of oak, finished in white and green. Sizes 21 in. high by 16 in. in diameter with 14 ft. easy raising and lowering pole. *Price* **$14.00.**

Free

this fascinating book "Your Bird Friends and How To Win Them" sent to anyone who loves our beautiful songbirds. Full of things you should know. Based on a lifetime of close bird life study.

BIRD PICTURES

475 subjects

Large, Beautiful 7x9" prints in natural colors

Twenty million Celebrated Dodson Mumford Pictures purchased from us last year.

Children Are Fascinated

Dodson Bird Pictures are the finest collection of color reproduction in the world. John Burroughs wrote: "They are astonishingly good. I like them so well I have put them on the walls of my rustic retreat." Order the birds you are most interested in and allow us to add those found in the same territory.

30 Prints postage prepaid $1.00

BEAUTIFUL BUTTERFLIES

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Wren House	$ 7.00	Bluebird House	$14.00	Bird Bath	$26.00
Martin House	60.00	Automatic Feeding			14.00
Flicker House	7.00	Shelter	8.50	Insect Pictures	.55
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Name.....

Address.....

Also send me complete list of nearly 1000 Nature Pictures and Free Book.

"Gentlewomen, if it be not too wet, may doe themselves much good by kneeling upon a cushion and weeding."

Giant Tulips at Pre-war Prices

OUR unusual offer of Holland's finest Tulip Bulbs is again repeated this year, and at a still lower cost made possible by the tremendous popularity which this offer gained last season. The great number of orders for these bulbs allow us to effect large economies in many ways, all of which mean a saving to you.

The Choicest May-Flowering Tulips

(Darwin, Breeder and Cottage Tulips)

Guaranteed to Bloom True to Color and to Yield the highest Measure of Satisfaction.

SELECT 50 BULBS OR MORE (as many as You want) in as many colors as You want, but in no case less than *five of any one color.*

Make Your Selection Now from These Colors

Crimson	Cerise	Orange-Cherry	Lavender
Carmine	Light Pink	Vermillion	Purple
Scarlet	Salmon-Pink	Yellow	Black
Orange	Flesh Pink	White	Rose Heliotrope
Rose	Bronze	White, flushed Pink	Yellow, flushed Orange

50 Bulbs $1.85 100 Bulbs $3.50

Postpaid Anywhere in America. Terms; cash with order. This offer is good only UNTIL JULY 1st, for we must reach Holland with your order in time to select your bulbs right on the fields from the finest new crops.

BEAUTIFUL GARDENS AT MODERATE COST, our exquisite new book for garden lovers is now ready. It contains complete cultural directions for Dutch Bulbs, Peonies, Iris, Lilies, etc.; sketches of the most gorgeous Tulip and Hyacinth beds, with instructions for planting for best display. Many illustrations of beautiful gardens and flowers in natural colors. Ask for a copy if you want to add a delightful bit of garden scenery at small expense.

Schenley Gardens, Box 75, Cheswick, Penna.

More than a million of our Tulips now in bloom in America

Scranton Offers Home

Dr. D. Webster Evans, president of the Zoölogical Society of Scranton, Pennsylvania, writes that his city has a "fine little zoo," and that any Nature lovers who want a good home for any of their personal pets are guaranteed such if they present them to Scranton. Dr. Evans says that the society is in a position to pay express but otherwise its funds are limited, all spare money being put into the job of making the zoo accommodations as good as possible. Dr. Evans gives his address as 157 South Main Avenue, Scranton, and if that is his office we hope that a playful mountain lion cub and a couple of black bears don't arrive when his waiting room is full of patients.

An Excellent Warning

In the March issue we reported the experience of a member in using tomato cans for bird houses. This note referred to their use in a sheltered place but Charles P. Shoffner, Associate Editor of *The Farm Journal* and secretary of the Liberty Bell Bird Club, very properly issues a warning. He reports that a dozen tin can bird houses were put up along with some 600 wooden houses on the Wallops Island bird sanctuary. The result was a sad one because a number of poor young birds were quite thoroughly cooked in these tin houses one very hot summer day. The best advice is to use the tin bird house only when it is safely in a place sheltered from the sun.

Paging Boy Naturalists

Members of the American Nature Association are to be found in many corners of the world and Donald Demming, one of our members in Morris, Minnesota, wonders whether there are any kindred boy naturalist souls to be found in the West Indies, South America, Mexico, Florida and New England who would like to exchange insects. Are there?

GUARD YOUR ROSES

from mildew and black spot

FUNGTROGEN cleans roses and other plants of all fungus, almost in a night, by invisible film. No injury to plant or foliage, no discoloration. Stimulates growth; richer foliage and blooms. Fungtrogen is easily soluble in water, will not clog nozzle of spray. Pint makes 8 gal. spray liquid. $1.50 postpaid. Recommended by leading rosarians.

Sole makers of companion sprays, *Aphistrogen*, for plant lice; *Insectrogen*, kills leaf chewing insects.

FREE Bulletin, *"Black Spot Control"*

Fungtrogen FUNGICIDE FERTILIZER

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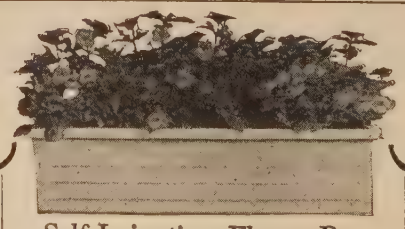

Self-Irrigating Flower Box

Made of Copper-Alloy-Steel of long life. Two colors, Old Ivory or Blue Green Enamel. Water can enter either end. Air circulation is provided under the soil which keeps the earth from becoming sour. Lengths range from 26 inches to 44 inches. Write for prices. Introductory price for 26 inch sent postpaid on receipt of price (in U. S.) $2.50. Money back guarantee.

METAL EGG CRATE CO.
242 Wolfe St., Fredericksburg, Va.

U.S. SIGNAL GLASSES

$7.90 Cash
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They are excellent for giving details at long ranges. U. S. Signal Glasses have black morocco leather covers, ickel barrels, sun shades, and carrying case with leather shoulder straps. Send check or money order now. Dept. N-627.

Guaranteed on a Money Refund basis if not in accordance with Adv.

NATIONAL IMPORT CO.
Insurance Bldg.
Washington, D. C.

A tulip border as shown above will, with ordinary garden care and culture, last for several years. The bulbs are really "flowers in embryo." They will bloom for everybody even in poor soil, though in good garden soil, the flowers will be larger and more brilliant

You SAVE and GAIN by Acting NOW!

You actually *Save* from 10 to 20% on your bulb order by taking advantage of our "nursery-direct-to-you" sales method. Withall we guarantee our bulbs to be equal in quality.

You *Gain* by securing Service of an extra-ordinary nature if you place your order Now—or at least *before August first.*

Bulbs are sensitive merchandise. The less they are handled the better. All early orders will be filled in Holland packed in bags of special make. After that no hands touch the bulbs until you open the shipment.

A Charming Tulip Border for Only $10.00

15 Bulbs each of 12 Choice Sorts—180 Bulbs in All!

During the last decade Zandbergen Bulbs have been perpetual Blue Ribbon Winners at Flower Shows throughout the country. The varieties in this selection all bear extra choice flowers of great substance and beauty.

John Ruskin—The salmon-rose, edged yellow. Cottage Tulips shown in foreground. Doz. 80c; 100 $5.50.

Turenne—Purplish brown with yellow margin. Doz. $1.35; 100 $10.00.

Dream—Pale Heliotrope Darwin. Doz. 65c; 100 $4.50.

Eclipse—Deep rich glowing blood red. Doz. $1.60; 100 $12.00.

Pride of Haarlem—Rose-carmine Darwin. Doz. 60c; 100 $4.00.

Mrs. Moon—Golden yellow Cottage. Doz. 70c; 100 $5.00.

Princess Elizabeth—Deep pink Darwin. Doz. 70c; 100 $5.00.

Clara Butt—Finest salmon-pink Darwin. Doz. 55c; 100 $3.50.

Grenadier—Red with yellow base. Doz. 90c; 100 $6.00.

Faust—Dark satiny purple Darwin. Doz. $1.00; 100 $7.00.

Bronze Queen—Soft buff Breeder. Doz. 65c; 100 $4.50.

Prince Albert—Glowing mahogany-brown, shaded dull bronze, Doz. $1.15; 100 $8.00.

Orders must be sent BEFORE August 1st, preferably at once!

Bulbs "In A Class All Their Own"

Bulbs that are guaranteed to bloom true-to-name or your money back. Bulbs guaranteed to develop into Blue Ribbon Winning Flowers—more than half the First Prizes being captured by our customers every year. We are ready to prove it in our show ground which please visit between May 20th and May 30th.

To those at a distance we suggest that you mail your orders at once for reasons given above. Send no money—unless you wish, in which case you may deduct 5% cash discount. Above all, send for our free catalog—the most truthful bulb book published, offering Tulips, American grown Daffodils, Crocus, Hyacinths and all other so-called Dutch Bulbs. When writing, please mention Nature Magazine.

ZANDBERGEN BROS., *"Tulipdom"* Oyster Bay, L. I., New York

Nurseries at Valkenburg, near Leiden, Holland

Wild-Flower Contest

A wild-flower contest, to continue ten years in the schools of the state, has been projected by the University of Texas with the purpose of familiarizing teachers and pupils with wild flowers of their own locality, says *School Life*. Annual exhibits will be prepared by the schools to consist of thirty specimens, ten gathered in the fall, winter, and spring, pressed and mounted according to directions announced by the professor of botany of the university, who is director of the contest. The scheme contemplates preparation of exhibits in triplicate and retention of one set by participating schools. The best exhibit in each county will be sent to the university. At the expiration of the ten-year period the university will have a collection of wild flowers from different parts of the state, and each school participating will possess an exhibit of three hundred authentically identified wild flowers of its locality. The process of collection is purposely made gradual in order that pupils may learn the specimens thoroughly, and that the numbers received at the university at any one time may not be too great.

DAHLIAS GLADIOLI

12 Large Cactus Dahlias	$1.00
12 Giant Decorative Dahlias	$1.00
30 Large Gladioli Assorted	$1.00
50 Blooming Size Gladioli	$1.00
12 Giant Flowering Cannas	$1.00
12 Hardy Chrysanthemum Plants	$1.00

Any Collection $1.00 *by Parcel Post*

ALL SIX PREPAID FOR $5.00

C. O. D. Shipment 10c extra

A wonderful collection of plants and bulbs for that garden you are planning. Have a real flowering garden all summer. Cultural directions with each order.

20 acres of flowers. Send for Catalogue

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THE LONGFIELD IRIS FARMS

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FRASER'S TREE BOOK

describes the Finest New Fruits, Nuts and Ornamentals. Full of facts to assist you in selection and planting. Copy on request.

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The Nature Calendar

"A Warning"

"Though you be a Yosian, an Appalachian, a National Geographer, and Audubonist, or a member of any nature guild, ilk, or ism whatever," says A. E. Hamilton in March **Camping**, "your pysco-digestive apparatus will not stand the perusal of this unique and delightful calendar at the rate of more than a single page at a time. Be warned!"

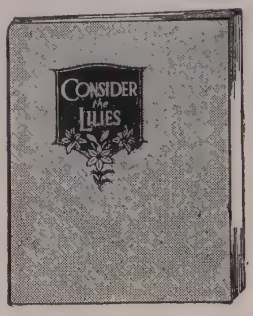
Nature facts and suggestions for nature activities for each day in the year are given by Professor William G. Vinal in this calendar. Learn why you have been "warned" against it by sending 40 cents and your order for a copy to

PLAYGROUND AND RECREATION ASSOCIATION OF AMERICA
315 Fourth Avenue, New York City.

"Consider the Lilies"

The book, "Consider the Lilies", which we have just published at considerable expense, will, we believe, be of great interest to every home owner and gardener.

It covers, in every detail, the history, description, planting and cultural directions of one hundred and one varieties with illustrations of sixty-five varieties in natural colors.



Postpaid on receipt of $1.00, which amount may be deducted on an order for bulbs, amounting to $3.00 or over.

Write for this beautiful book to-day, as the quantity for distribution is limited and it is valued at $2.00.

Learn to know Lilies—If you love flowers you will want this book with its description of 101 varieties. It will pave the way to garden delights previously unknown.

"The House of Lilies"

W. E. MARSHALL & CO., Inc.

156 West 23rd Street, New York City

How To Make Evergreens Flourish

The porous, tender rootlets of conifers tend to shrivel up and slowly kill the whole tree if they are not protected from moisture loss in the surrounding soil. Peat Moss having a slightly acid reaction is a natural feeding material for Evergreens and Evergreen Shrubs because its constituents are native to the forest soil in which they flourish best. Dig into the soil about 2 inches deep and spread as a mulch.

IMPORTED GRANULATED

PEAT MOSS

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will increase their vitality and promote growth. The whole family of Broad-leaved Evergreens, like Azaleas, Kalmias, Rhododendrons, etc. respond favorably to its use. The surprising capacity of Peat Moss for absorbing soil water and holding it for future use, keeps the growth beneath the Evergreens moist and ideal for growth and vigor. Test it this way: We will deliver prepaid a small trial bale for $1.50 and will include FREE material for making 10 gallons Strong Liquid Fertilizer—clean and odorless.

A full sized bale spreads 240 square feet, one inch deep. Price $4.00 a bale, F. O. B. New York. Shipped from other principal cities at same or slightly higher price. Garden and Lawn Booklet free.

ATKINS & DURBROW, Inc.,
E-25-Burling Slip **New York**

TRADE MARK G P M

Scott's Creeping Bent for Perfect Lawns

Sod in six weeks! A rich, velvety stretch of lawn that chokes out weeds before they can grow! A deep, thick, uniform turf that's everlasting and makes your home a beauty spot! That's what you'll get if you plant Scott's Creeping Bent.

The New Super-Lawn

Creeping Bent--long recognized as the ideal grass for golf putting greens--is now producing Super Lawns. Instead of sowing seed, you plant stolons or the chopped grass--and in a few weeks you have a luxuriant lawn like the deep green pile of a Turkish carpet. Read all about this unusual grass in our illustrated booklet "Bent Lawns." Mailed on request.

O. M. SCOTT & SONS CO.
361 Main Street Marysville, Ohio

Strong-Rooted, 2-or-3-yr.-old Bushes; nearly 2 ft. high

To add quickly 1000 more customers we make this remarkable SPECIAL OFFER on the finest, fragrant varieties,—

COLUMBIA—newest big pink; GOLDEN OPHELIA—rich yellow; PREMIER—rose pink; DOUBLE WHITE KILLARNEY—ivory white; AMERICAN LEGION—fragrant new deep red.

Every bush has already bloomed. **GUARANTEED TO GROW AND BLOOM FOR YOU, OR MONEY BACK.** Pick regular, long-stemmed, hot-house roses all summer and till frost comes.

ACT NOW Low price holds good only till limited number of collections is sold. Send $1.95 today—all five bushes mailed **postpaid** to your home when planting season opens. If beyond the Mississippi River add 20c.

FREE Collins 1927 HELPFUL GUIDE—includes special offers on Dahlias, Chrysanthemums and other Perennials, Gladiolus, Climbing Roses, Evergreens, Privet and Barberry Hedge, Flowering Vines, Fruit Trees, Grapes and Berry Plants.

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FREE CIRCULAR

Wood ashes delivered, farm and garden fertilizer $30 per ton.

GEORGE STEVENS
Peterborough, Ontario, Canada

Poetry Contest

Announcement is made by the Chattanooga Writers' Club of its 1927 Nature poem contest for the memorial prize established in the name of Elberta Clark Walker by Robert Sparks Walker. A first prize of $20 is offered for the best Nature poem from any entrant, and a second prize of $10 for the best Nature poem by a southern writer living in the South. Poems should be original and unpublished; not more than seventy-two lines; author's name not on manuscript but in separate sealed envelope. The prize winning poems become the property of the club, no manuscripts are to be returned and the contest closes November 1, 1927. Poems should be sent to Miss Sarah Stansell, 2101 Duncan Ave., Chattanooga, Tennessee.

Add Nature "Colyums"

For some reason or other in mentioning Nature columns in the newspapers we have not yet remarked on the fine column that Roland Case Ross of the Los Angeles City Schools Nature Study Department has been running in the Pasadena *Star-News*. It has been running, aye these three years under the caption of Nature and Wild Life and, no doubt, Pasadena could not now get along without it.

And while we are west of the Father of Waters let us mention another column entitled News and Views and conducted by Frank Francis in the *Standard-Examiner* of Ogden, Utah. While not always or entirely Nature, its conductor has the outdoor urge and interest. The total of Nature "colyums" is growing as the returns come in.

Bobolinks Protected

Under an order issued by the Secretary of Agriculture it is no longer permissable to kill reedbirds or rice birds,—known in the North as bobolinks. In 1919 protection was removed from these birds owing to serious damage they did to the rice crop, but this need is now regarded as over and shooting is now allowed only on special permit from the Secretary of Agriculture countersigned by the chief official in charge of the fish and game laws of the State in which the permit is effective. Then the shooting can only take place between August 16 and November 15 and on rice fields where it is proved that the birds are injuring crops.

Willows in the Snow

Writing on March 10, E. E. Newell of Hood River, Oregon, reports that he ha I just been out picking pus-

sy willows while mounted on skis and atop a snow bank. Strange, you say? Mr. Newell says that while the willow tree blossoms have been out on the lower level of the Columbia River for five or six weeks, three weeks before he wrote he had been up Mount Hood and there were the upland willows blossoming away with two feet of snow around the base of the trees. The explanation was easy, Mr. Newell points out, the ground had not frozen before the snow fell and the roots, bulbs and grass under the warm coverlid of snow were springing into full Spring action.

Naming Douglas Fir

How many know the reason for the naming of that majestic tree of the northwest, the Douglas Fir? The California office of the United States Forest Service provides us the answer. A century ago David Douglas, a young Scottish botanist was enduring privations and pioneering for science in Oregon. He discovered and described many trees and plants and it is related that he first saw the three that was to bear his name when he came to the Columbia River on April 8, 1825. He described it as "a species which may prove to be *Pinus taxifolia.*" When his specimens arrived in England the tree was first called *Pinus douglasii* but it was soon seen that it was not a pine. It was finally called *Pseudotsuga taxifolia,* or false hemlock. Incidentally, Douglas fir is the correct name for this tree, not Oregon pine, red fir or yellow fir, by which names it is locally known and marketed.

Camps in the Forests

The North Pacific District office of the United States Forest service is making it easy and attractive for the forest-loving public. It announces that in the 22 National Forests in the district there are 244 forest camps equipped with camping conveniences. At some the improvements have been modest for lack of Congressional appropriations (and filibusters) but all are usable and inviting.

Iris and Peony Catalogs FREE!

My 1927 Iris and Peony Catalogs, beautifully illustrated, will help you make your garden more beautiful. These catalogs contain descriptions of wonderfully colored Irises and Peonies, including the newest varieties, both American and European introductions. Complete planting and cultural instructions are given. Write for free catalogs.

My Garden Notes, which relate my own garden experiences, are also free. I will be glad to mail you a sample copy.

LEE R. BONNEWITZ
South Washington St., Van Wert, Ohio.

Where Rest is Waitin'

The day's fishin' trip has been wonderful—the weather clear and the fish bitin', but more wonderful still is the little cabin in the clearin', where rest is waitin'—where nothin' looks better than the old pipe and slippers, the steamin' cook stove and the faithful old Rustic Hickory chair.

Thousands of sportsmen look forward to the sunsets of their fishin' days, and the rest that's waitin' them at their Rustic-Hickory-equipped summer homes. On river, lake or seashore this natural wood furniture has been the sportsmen's choice for over 25 years. And why shouldn't it be? It will last a lifetime, looks like a million dollars in any natural surrounding, and is as comfortable as your old plug fishin' hat.

Rustic Hickory Furiture is made in 130 styles for every summer furniture need—inside or out—beds to bird houses.

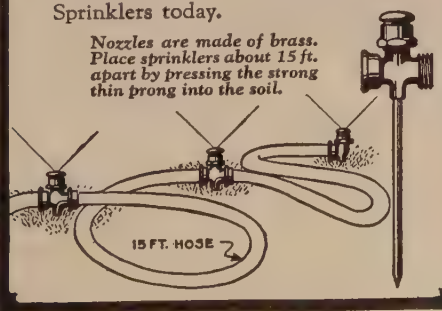
Invest in better rest this summer. Send for our beautiful catalog B.

RUSTIC HICKORY FURNITURE CO.
LA PORTE, INDIANA

Your Old Hose and $3.75 gives you a Multiple Sprinkler

For only $3.75 you transform your old hose into a handy Multiple Sprinkler. Easily connected—portable—can be quickly moved to any part of your lawn or garden. Now you can economically water your whole lawn at once with a fine drenching mist. Send for a set of our Multiple Sprinklers today.

Nozzles are made of brass. Place sprinklers about 15 ft. apart by pressing the strong thin prong into the soil.



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Enclosed find $3.75 for which send me postpaid a set (3) of your Multiple Sprinklers.

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WATER-LILIES

Can be planted in Spring for beautiful blooms this Summer. Rich colors, refined fragrance, hardy big roots—over 75 varieties—the rarest and fairest from the largest Water-Lily Garden in the country. Easy to grow. Send today for Catalog.

THE W. B. SHAW
Aquatic Gardens
Kenilworth, Washington, D. C.

WILD FLOWER COLOR PLATES

Red Columbine, Lotus, Lady's Slipper, Dutchman's Breeches, Mt. Laurel, Dogwood, Bloodroot, Trailing Arbutus, Cardinal, White Trillium, Fringed Gentian, and Maidenhair Fern on post cards, 27 cents; $20 per 100 sets.
2 sets of 6 from Feb. and May Nature Magazine, 12 cents per set; $10 per 100 sets.

Outlines for Children to Color

12 cents per doz., 75 cents per 100, 10 cents each for 25 or more Jr. members brings button, pledge, 6 outlines, circulars, for each; 12 color plates and periodical for organizer.

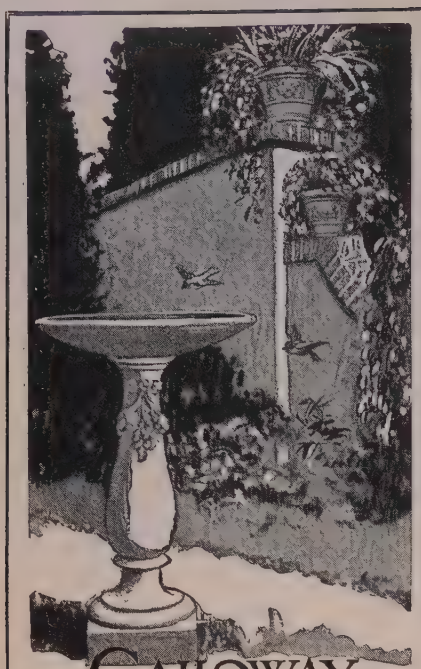
Plant Wild Flower Seed

Red Columbine, Holly, Yucca & Dogwood, 12 cents per packet.
Soil testing sets for gardens $2.25.

Photographs—Lantern Slides

Annual members with quarterly periodical, Wild Flower, $1.50; contributing members (with periodical) $5; sustaining members (with periodical) $10. Color plates free to members with periodical.

WILD FLOWER PRESERVATION SOCIETY, Inc.
3740 Oliver St., Washington, D. C.



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TIME defying, beautifying high fired Terra Cottas that will give enduring charm to your Garden, Sun-room and Porch.

Send for Brochure of attractive Bird Baths, Sun Dials, Gazing Globes, shapely Jars, Flower Vases and Pots, Benches and other decorative accessories. *Established 1810*

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For Jaded Appetites

Within a few years we may be eating all sorts of new vegetables and fruits, brought from the far away East Indies and China, according to a recent statement of the U. S. Department of Agriculture. This announcement gives the results of a two-and-one-half-years' search by P. H. Dorsett, the Agricultural Explorer of that Department and his son, through these out-of-the-way countries for plants that might be useful in American agriculture. They are reported to have brought back thousands of selections of seeds, plants, scions, bulbs, tubers and cuttings. This material must pass through the usual governmental stages of inspection and reinspection for infection by insect pests, then be tested out in experimental gardens to determine its adaptability to our climate and soil, and it may take ten years before we are able to be introduced personally to some of the good things listed, among which are noted soy beans, and mungo beans, the latter used as sprouts (a kind of vegetable vermicelli) in Manchuria and parts of China, new varieties of wheat and barley, Chinese fruits and nuts, a new apricot with great possibilities for resisting northern climates, a hardy table grape, a new wild grapefruit, Ceylon's best milk coconut called the King, and many other exotic fruits and vegetables, which we may learn to appreciate in the years to come.

Katydid Egg-Laying

Miss Ruth Ingraham of Los Altos, California, sends us the following account of a Katydid guest which is of such interest that we gratefully publish it. Miss Ingraham writes:

"Here are Katydid's eggs laid in the fold of a time-table in which she made careful and laborious incisions with her blade-shaped ovipositor, right under my astonished eyes as I sat at my desk writing, one September evening. She had crawled out of an open letter in my basket, having evidently chosen, at some point of my walk through the fields from the post-office, to come home with me. She went slowly about the desk, carefully examining everything with which she came in contact, and at one time approached me, gazing at me so steadfastly with her mild and melancholy eyes that I almost felt as if I had been

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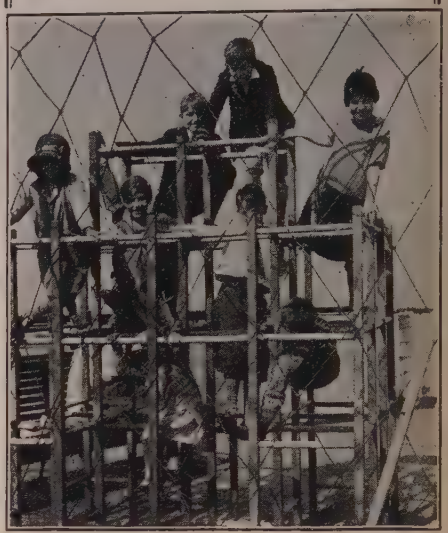
A Play Apparatus
Patented October 23, 1923; March 25, 1924



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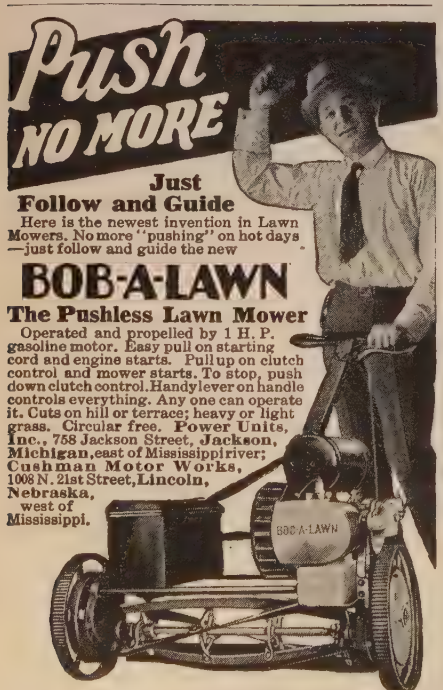

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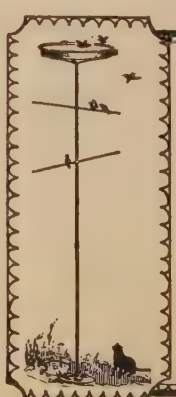

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spoken to. From time to time I watched her through various lenses. She was a beautiful creature, light green in color, two inches or more in length, quite perfect so far as I could discover, and quite lively in resisting my efforts to take her and put her outdoors. She had finished with the time-table and was exploring a pigeonhole, when at last it became so late that I was falling asleep at my post, and had, reluctantly, to give up watching her.

"Whatever made her choose indoors, instead of out, and dry paper instead of green leaves, I can't imagine, but it was a very interesting experience for me. Look at the eggs under a high-power glass and you will see how Katydid split the paper itself so that the eggs are partly incased by its fibers."

Mrs. A. N. Caudell of the U. S. National Museum, a specialist in Orthopetera, is greatly interested in the fragment of thin paper containing the flattened oblong eggs, and the specimen has been presented to the collection. Mr. Caudell tells us that it is almost certainly the work of a species of *Scudderia,* and that it is the most remarkable example of the egg-depositing of these insects that he has ever seen. The usual depository is a leaf, which the Katydid has no difficulty in splitting with its ovipositor. In the case of the paper, however, which is so thin that typewriting may be read through it the skill of the insect in splitting the fabric, and inserting the eggs, nearly one-fourth of an inch in length, so neatly that an unbroken film of paper covers them, is so remarkable that it can hardly be appreciated from a description.

This is only one instance of the interesting and remarkable things that the close observer finds in Nature.

Fatal to Bluebirds

Mute evidence of the fate that befell countless bluebirds last spring in Clinton County, Iowa, is contained in a little account given by Mrs. Ansel O. Cole in a recent letter. A woodsman and keen observer of Nature, John Rohr, after a very severe storm, noticed as he was walking along the railroad tracks two dead bluebirds beside a telegraph pole. Looking up he saw blue feathers protruding from a flicker's nesting hole in the pole. From that hole Mr. Rohr pulled eighteen more dead bluebirds, starved and frozen, victims of the blizzard, doubtless smothered in their attempt to find shelter. To this storm Mrs. Cole ascribes the almost total lack of the usual great flocks of

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Compiled and Edited by FRANCIS E. CLARKE

With introduction by EDWIN MARKHAM
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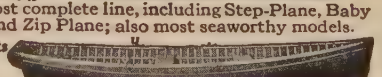

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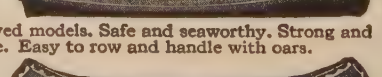

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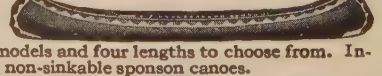

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bluebirds at the time for their southern migration last fall, although large flocks of them had appeared in the spring prior to the great storm.

British Bird Study

It is easy to imagine the lads and lassies of Merrie England as well as the bairns of the land of the thistle entering whole-heartedly into the contest sponsored by the Royal Society for the Protection of Birds in the British Isles. To know the birds is to love them; to love them is to protect them, and thus wisely the Society is starting its campaign with the children of the country that they may *know* the birds. The school children are organized for book study and field work. Upon completion of the course an essay is written, the theme of which is of the child's own choosing. A shield is awarded to the group best represented. It is easy to visualize these little ones in their eager study of birds, but it is difficult to estimate the deepening and broadening this study will bring them, and the possibilities that it may hold in the way of developing naturalists to carry on in the future.

A Unique Park

Illinois has something unique in its Great Cahokia Mound Park, said to be the largest prehistoric Indian mound in the United States. Monks' Mound covers sixteen acres, a pile of earth that it is estimated required the work of twenty-four hundred men, ten hours a day, for two years, to pile up. Around this masterpiece, with its flat top and terraces, are scattered forty-five smaller mounds. The Park, which is administered by the Illinois Department of Public Works, is being beautified and improved and a new road being built. These Indian mounds are of especial interest to archaeologists, who differ in their opinions as to their origin. Some advance the theory that these mounds were constructed by the Aztecs who worked northward from Mexico along the Mississippi; others contend that relics found in these mounds indicate an earlier and higher civilization. The Park gives to the state of Illinois, always eager to exploit its many advantages, a delightful recreation ground spread out on Nature's textbook, the open pages of which afford opportunity for study and research.

See Inside Cover *for* Activities Page

When Pharaoh Was a Little Boy

By WALLACE HUTCHINSON

More than 3,000 years ago, long before Moses led the children of Israel out of Egypt and when Pharaoh was but a little boy, a tiny forest seedling pushed its way up through the earth and moss into the gray dawn of an unknown world.

Through the long centuries, warmed by the kindly sun and fed by bountiful Mother Nature, this little denizen of the forest grew on. Empires rose and fell, monarchies waxed and waned and new nations came into being, and still it grew and prospered.

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The New Standard Twin

An all-purpose motor. For lake and resort cottagers. For racing, planing-type boats as well as large rowboats. Weight, 55 pounds. Speed, 2 to 22 m. p. h., depending upon type of boat used.
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To-day, in majestic grandeur, far o'er-topping its mates, it stands among the high Sierras, a milestone of the ages. Deep furrows line its massive trunk and Time has laid his heavy hand upon its spreading crown.

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The Department of National Resources of the Chamber of Commerce of the United States has announced that a conference will be held under the auspices of the National Chamber, probably in the autumn, to consider the possibilities, difficulties and accomplishments in growing trees as a private enterprise. Opportunity will be afforded for discussion of practical problems from the point of view of those intimately connected with the industry, a practicable program formulated to encourage the development of commercial forestry, and an attempt made from a business man's viewpoint and with a business man's enterprise to make of forestry a business that will give it a place with agriculture and manufacturing in the national economy.

Birds in the City

Mrs. Ansel O. Cole of Clinton, Iowa, furnishes a very interesting little account of the appreciation shown by a pair of tufted titmice for the hospitality of her bird-feeder which was well supplied all last winter with tempting sunflower seed. Evidently deciding not to wander far from this base of supplies, they nested near her home, instead of seeking the deep woods, as is their habit. Later they brought eight hungry youngsters to the generous board. This winter the parent birds reappeared, and, evidently having passed the good word along where titmice foregather, four of Mrs. Cole's bird-loving neighbors are entertaining titmice at their bird-tables. In her letter Mrs. Cole uses the very significant expression which might well become a slogan: "If the city loves the birds the birds will love the city."

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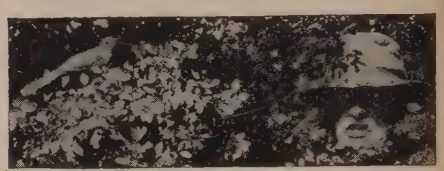

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Questions and Answers

The American Nature Association will be glad to answer each month such questions as its members ask about Nature.

QUESTION: *I note the statement in the February issue that the snowy owl lives upon rabbits, mice and lemmings. I would like to inquire if lemmings are to be found on the American continent. I had the impression that they are European animals.—V. H. McG.*

ANSWER: Lemmings are of circumpolar distribution. The famous lemming of Norway, *Lemmus lemmus,* is represented in America by several species occurring from Alaska to Hudson Bay, and in the Canadian Rockies. These are brown summer and winter. Besides these we have lemmings of the genus *Dicrostonyx,* also circumpolar, which turn white in winter. These are found in the Arctic from Alaska to Labrador.

QUESTION: *I am interested in the fastest winged animals.—F. M. N.*

ANSWER: The fastest flying creatures are probably among the insects. The fastest birds known are some of the swifts.

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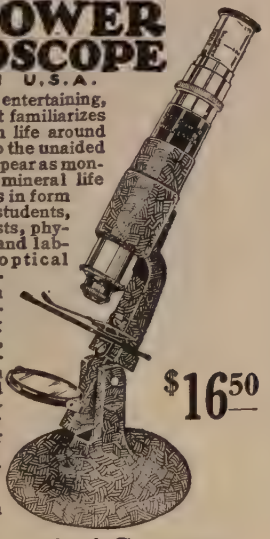

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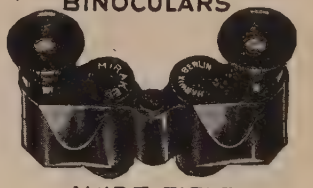

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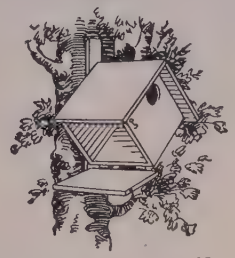

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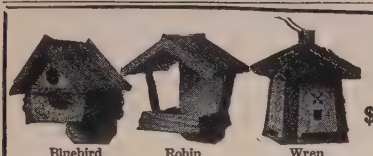

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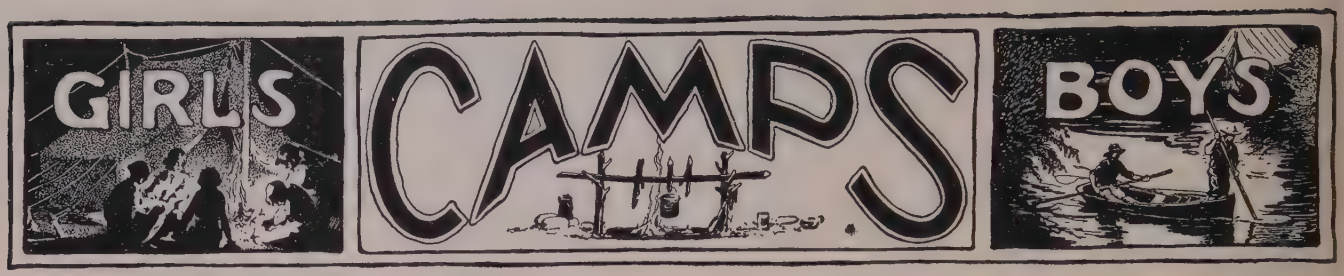

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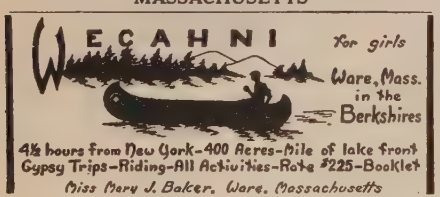

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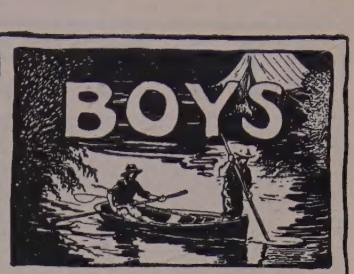

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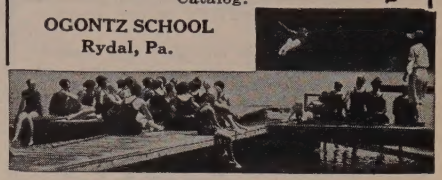

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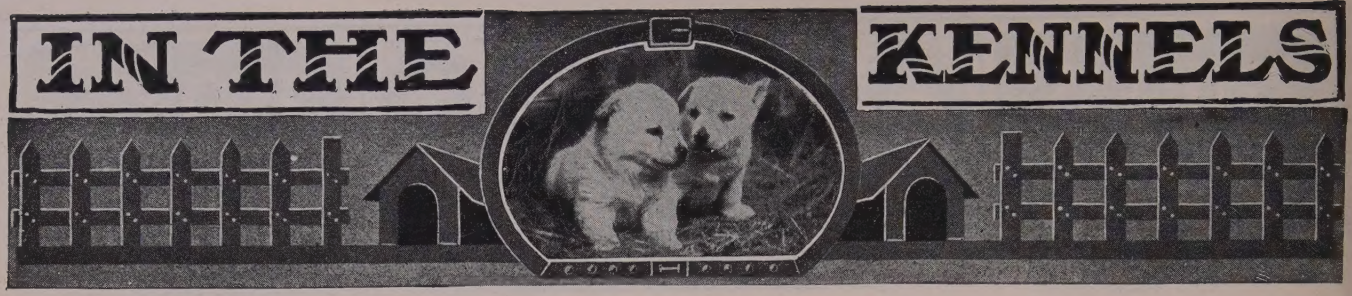

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THE TREE PLANTING ARMY

Memory tree for a forestry law in Georgia; Camp Fire Girls have anniversary campaign under way throughout the country

Aiming at new records the tree planting army is in the field again. Reports to the American Tree Association show planting on Roads of Remembrance is being continued and new ones planned. A move for a Memory Grove is reported from Nashville, Tenn., by Mrs. Charles Cohn.

Under the direction of A. M. Stanley, Secretary of the Orange County Farm Bureau, tree planting programs in Orange County Park, Calif., were conducted in which 1,400 Coulter pines were placed. The planting was all done by volunteer workers, thirty members of the Tustin and Villa Park Agricultural clubs helping out. County Forester Robert Northcross directed the work Delphia Phillips reports. Talks on forestry were given by Clifford Stanford, assistant chief forester of Los Angeles County; J. E. Elliot, supervisor of the Cleveland National Forest; Willard Smith, of the county board of supervisors, and Prof. Woodbridge Metcalf, University of California and Mrs. George T. Kellogg, chairman of the tree conservation committee, Orange County Federation of Women's Clubs.

Boys and girls in 4-H clubs in fifteen counties of New York State planted 495,000 trees this Spring as their first years work in a three year forestry project. The purposes of the first year in the forestry project are to instruct boys and girls in the principles of tree planting and to encourage them in establishing forest plantations. Beekman Winthrop, who has been planting at Westbury, Long Island, since 1914, reports to the Conservation Department the planting of several thousand trees this Spring. One plantation that is unique is by Wilson M. Powell at Chatham. It consisted of 2,000 trees of every variety grown in the state's nurseries. He has been planting trees since 1915. Wesley Goodfellow of Fulton has placed 3,000 trees.

The educational campaign in New York was begun April 1 at a meeting of the Conservation Department of the Women's Clubs at Wanamaker's Auditorium in New York City. The meeting was planned by Mrs. Charles Cyrus Marshall, conservation chairman. Charles Lathrop Pack was one of the speakers.

A tree planted by Her Majesty Queen Marie, is the proud boast of the Federation of Women's Clubs. Through the assistance of Mayor Bertha Landis of Seattle the Federation entertained Her Majesty at a reception and this function was preceded with a tree planting ceremony. Her Majesty and her two children, each throwing on the earth.

One of the biggest tree planting campaigns is that of the Camp Fire Girls who are making their fifteenth anniversary with a tree planting year. At the same time, of course, they place trees that will be of tremendous interest when the centennial of Arbor Day in 1972 arrives. First reports are coming in. The Camp Fire Girls of Humboldt County distinguished themselves by making a concerted effort to reclaim cut-over forest lands with redwood seedlings on several acres of the Carson Woods near Fortuna, Calif. The planting was directed by M. Chester Merrill of the Humboldt Redwood Reforestation Association. Mrs. H. C. Brokaw, the head guardian, was assisted by Miss Esther Cunningham and Mrs. Helen McMahon.

At Pasadena Camp Fire Girls, led by Mrs. W. Fiske Hannaford, president of the Guardian Association, and Mrs. Mabel Crawford wielded shovels and planted 162 pine trees to mark their tree year work.

Camp Fire Girls of Indiana celebrated with tree planting programs. All Indianapolis groups gathered at the Masonic temple for a grand council fire in praise of and dedication to the service of trees. S. R. Esten of the state forestry department gave an illustrated lecture on "Trees of Indiana," and a pageant was presented.

Members of the Mawahasa Camp Fire Girls at Dallas are after the 1927 national honors. R. A. Gillian provided trees for the planting. Mrs. Winifred Stulce is the group guardian.

The "Camp Fire Forest" at Highland Park, near St. Paul, will be planted in May. Plans were completed at a meeting of the committee on arrangements at which Judge Oscar Hallam, president of the Camp Fire council, presided. More than 500 pine and spruce trees are to be planted at a public ceremony. On the committee are Robert W. Hasslen, Parker O. Anderson, G. T. Conzet, H. C. Wenzel and Miss Frances Sutherland, Camp Fire executive.

A hundred Seattle Camp Fire Girls went to Vashon Island to start planting a highway of friendly trees. Through the courtesy of the University of Washington forestry department, 200 locust trees were obtained. The planting begins at Vashon Heights and proceeds for a mile on both sides of the road. Prof. Kirkland of the University of Washington and F. B. Myers, supervised the planting. Mrs. Wallace Beall and the Vashon Commercial Club helped with the plans.

A tree, planted with special ceremonies on the capitol grounds in honor of Governor Walker's administration, during which the Georgia law creating a state department of forestry was passed, featured Atlanta's Arbor Day observation. Attorney General George M. Napier delivered the address. Mrs. Oscar Paulmour, president of the Fifth District federation; Mrs. B. D. Gray, and Mrs. W. B. Price-Smith, took part. There was a short talk by Miss Alice Baxter, a member of the state forestry board.

Southampton Post, American Legion, is planting trees along the twenty-five mile stretch of state highway, No. 35, within the limits of Southampton County, Virginia, as a memorial to the World War dead of the county, Henry M. Taylor, department commander of the Legion reports. Trees have been planted on both sides of the highway at intervals of about fifty feet for a distance of five miles.

The memory of four men who died in the World War was honored by a redwood tree planting and exercises at the Washington, Calif., School. The men were: Lester R. Palm, Almer J. Norton, Percy C. Eugene and Charles D. Mains. Rites were read by Mrs. I. K. Manchester. The trees were planted by Norman Reynolds, assisted by Fred Hart. Otis Babcock of Sacramento was the speaker.

Three palm trees, the nucleus of a "friendship grove," were planted at Riverside by Zona Gale, Joseph C. Lincoln and Dr. Henry Van Dyke. Prominent visitors to Riverside will be invited to set out trees in the grove and each tree will be named after its planter.

In Golden Gate Park, San Francisco, the seventy-eighth anniversary of the birth of Luther Burbank was observed by the schools. Mrs. Burbank and her niece Betty, aided by "Uncle John McLaren" planted a redwood tree. The day, March 7, is Arbor Day in California.

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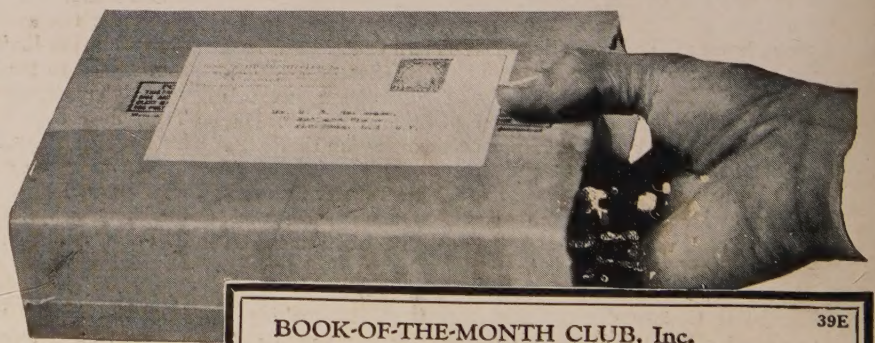

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